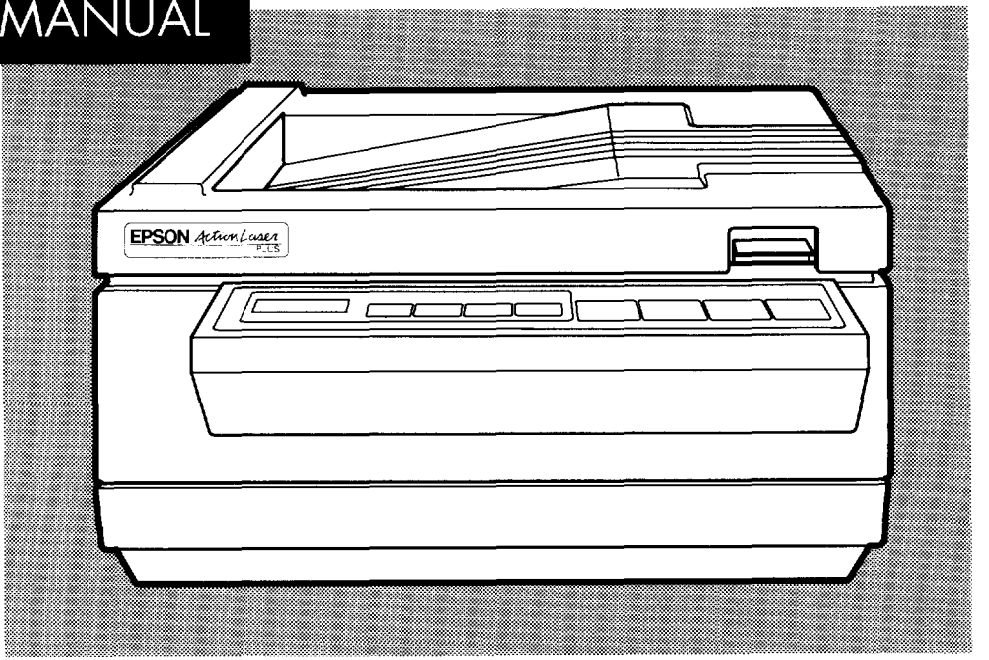
EPSON® ActionLaser PLUS™

USER'S MANUAL



FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by Epson America, Inc., could void the user's authority to operate the equipment.

CAUTION

Use of controls or adjustments, or performance of procedures, other than those specified in this manual may result in hazardous radiation exposure.

FOR CANADIAN USERS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le réglement sur le brouillage radioélectriques édicté par le Ministére des Communications du Canada.

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User's Manual

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IMPORTANT SAFETY INSTRUCTIONS

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning the outside of the unit.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding type plug.
9. Do not locate this product where the cord will be walked on.

10. If an extension cord is used with this product, make sure that the total of **the** ampere ratings on the products plugged into the extension cord do **not exceed** the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

11. Never push objects of **any** kind into this product through cabinet slots, as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of **any** kind on the product.

12. Except as specifically explained in the User's Manual, do not attempt to service **this** product yourself. Opening or removing those covers **that** are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to service personnel.

13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

    A. When the power cord or plug is damaged or frayed.

    B. If liquid has been spilled into **the** product.

    C. If the product has been exposed to rain or water.

    D. If the product does **not** operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore **the** product to normal operation.

    E. If the product has been dropped or the cabinet has been damaged.

    F. If the product exhibits a distinct **change** in performance, indicating a need for service.

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About This Manual

This user's manual provides step-by-step instructions on setting up and operating your laser printer.

Finding your way around

The introduction includes important information on precautions you should take while operating your laser printer. It also discusses the features of your ActionLaser Plus,™ tells you where you can get help, and lists the options available for this printer.

- Chapter 1 contains information on unpacking and setting up your printer.
- Chapter 2 includes information on testing the printer and connecting the printer to your computer. This chapter also describes how to change your print density setting.
- Chapter 3 contains information on general printer operation, including SelecType.
- Chapter 4 details paper handling.
- Chapter 5 gives you information on the HP LaserJet series II mode and FX emulation mode, including command summaries.
- Chapter 6 gives you information on maintaining and transporting your printer.
- If the printer does not operate properly or the printed results are not what you expect, see Chapter 7 for a list of possible problems and recommended solutions.
- See the appendixes for information on available symbol sets and a list of technical specifications.
- The manual concludes with an index.

- A Quick Reference Card at the back of the manual provides a map of SelecType menus.
- The back flap area has a front and rear view of the printer designating major parts. Views of the printer's internal components are also shown.

Conventions used in this manual

WARNINGS must be followed carefully to avoid bodily injury.

CAUTIONS must be observed to avoid damage to your equipment.

Notes contain important information and useful tips on the operation of your printer.

Introduction

The ActionLaser Plus printer offers high performance and reliability and a wide range of features. Your printer combines a semiconductor laser with electrophotographic technology used in office copiers to give you high-quality printing that is both fast and quiet.

The imaging system used by your laser printer is driven by a powerful computer that allows the printer to compose an entire page in internal memory before printing. The printer can manipulate the page it holds in memory to provide you with the ability to mix text and graphics, create predefined forms, and print with a range of fonts normally associated with typeset material.

Features

In addition to the high-quality printing and ease of operation you have come to expect from Epson® printers, the ActionLaser Plus printer offers the following:

- HP LaserJet series II emulation resident in the printer, giving you access to the wide range of software written for Hewlett-Packard laser printers.
- Epson FX emulation that uses the ESC/P® standard.
- Epson's SelecType feature that gives you touch control over many printer features, including font selection, paper size, and interface settings.
- One slot available for font cartridges.
- The ActionLaser Plus can accommodate HP-compatible soft fonts.
- A built-in 512KB of RAM. A 2MB memory board option (upgradable to 4MB) is also available.

- High-quality, 300 dot-per-inch (DPI) printing at a speed of 6 pages per minute for letter-size paper.
- Two paper delivery methods: face-down delivery for collated sheets and face-up delivery for printing on media requiring a straight paper path and for immediate viewing of printed output.
- Three built-in interfaces: parallel and RS-232C and RS-422A serial.
- A small footprint and a light weight.
- Enhanced paper handling capabilities that allow you to select a variety of sizes for automatic feeding without having to change paper cassettes. A manual paper feed capability is also available.

Where to get help

Customer service for Epson products is provided by a network of authorized Epson Customer Care Centers throughout the United States.

Call the Epson Consumer Information Center at 1-800-922-891 1 for the following:

- Customer Care Center referrals
- Technical support referrals
- Information on Epson User Groups.

Options and supplies

To locate or purchase accessories or supplies, contact the store where you bought your printer or call Epson Accessories, Inc. at 1-800-873-7766.

Replacement Toner Cartridge	#IBS300
Drum Unit	#IBS301
Optional 2MB Memory Board	#IBS401

Memory management

Your printer has a standard memory of 512KB expandable to 2.5MB with the purchase of the optional 2MB memory board. An additional 2MB can be added to the optional memory board for a total memory of 4.5 MB.

If you wish to print full-page, 300 dot-per-inch graphics or perform other sophisticated print jobs (such as complex pages using a variety of fonts), it is recommended that you install the optional 2MB memory board.

Laser printer precautions

Certain precautions are necessary to ensure the safe and efficient operation of a laser printer. The following list of precautions applies whenever you open the printer cover. Even if you are familiar with other types of printers, be sure to follow these precautions carefully.

- Be careful not to touch the fuser, which has a hot surface. (The fuser is the orange-colored area on the left side of the printer, inside the cover.) There is a label on the fuser warning you not to touch the hot surface.
- Protect the light-sensitive drum from exposure to light. You should avoid exposing the drum unit to room light for any longer than necessary. Never expose the drum to lighting any stronger than room light. Overexposing the drum may cause abnormally dark or light areas to appear on the printed page, reducing the service life of the drum.

  If you must expose the drum, either by taking the drum unit out of the printer or by leaving the printer cover open, cover the drum with a soft cloth or sheet of paper.

- If you remove the drum, developer unit, or basket from the printer, always set them on a clean, smooth surface. Be sure not to scratch or mar the roller on the developer unit or the surface of the drum. Also avoid touching the drum, since oils from your skin can permanently mar its surface and affect print quality.
- Never try to force the printer's components into place. Although the printer is designed to be sturdy, rough handling can damage the printer.

Chanter 1

Setting Up the Printer

1

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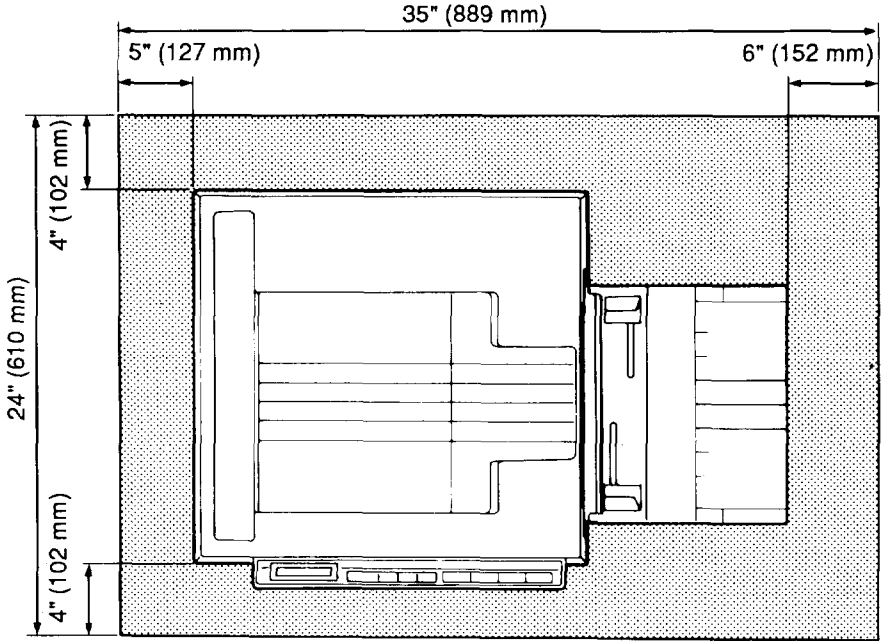
Finding a Place for the Printer

Setting up your printer is a simple process that takes only a few minutes. You need to find a location for your printer and install a few parts. Then your printer will be ready to be connected to your computer.

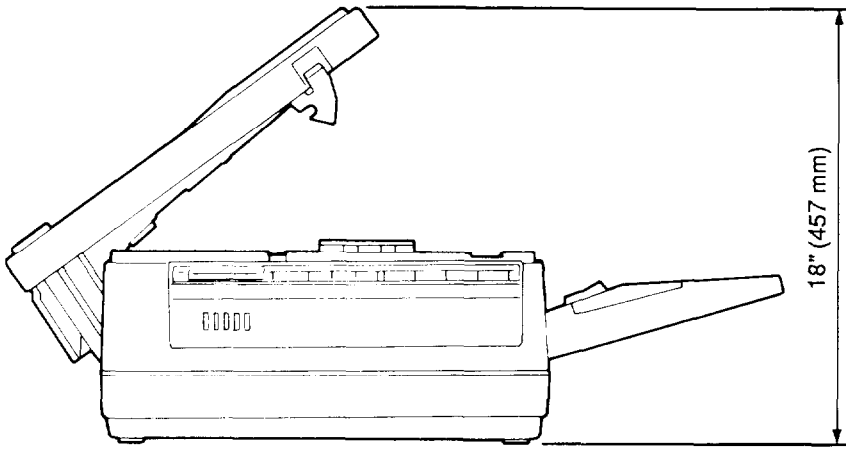
Before setting up your printer, you need to find a suitable place to use it. Be sure to keep the following points in mind when selecting a place for your printer:

- Place the printer on **a flat,** stable surface.
- Place the printer close enough to the computer or workstation for its cable to reach.
- Your printer is equipped with four rubber feet. Be sure that your printer stand or desktop is large enough to accommodate all four feet.
- Use a grounded outlet-one that has three holes to match the power plug on the printer. Do not use an adapter plug.
- Leave adequate room around the printer to allow easy printer operation and maintenance. You need to locate a space that is 35 inches (889 mm) wide and 24 inches (610 mm) deep. When you install the printer in this space, you should make sure there is sufficient room on each side of the printer. See the following diagram for details.

> **Note:** If you plan to install the faceup output tray, you need a space that is 44 inches (1118 mm) wide and 24 inches (610 mm) deep. Within this area, you need 13 inches (330 mm) of flat, unobstructed space to the left of the printer, rather than the 5 inches (127 mm) shown in the diagram below. There should be at least 2 inches (50 mm) of space to the left of the tray after it is installed.



To give you enough room to open the printer cover, allow 18 inches (457 mm) from the bottom of the print& to any shelf or surface directly above the printer.



CAUTIONS:

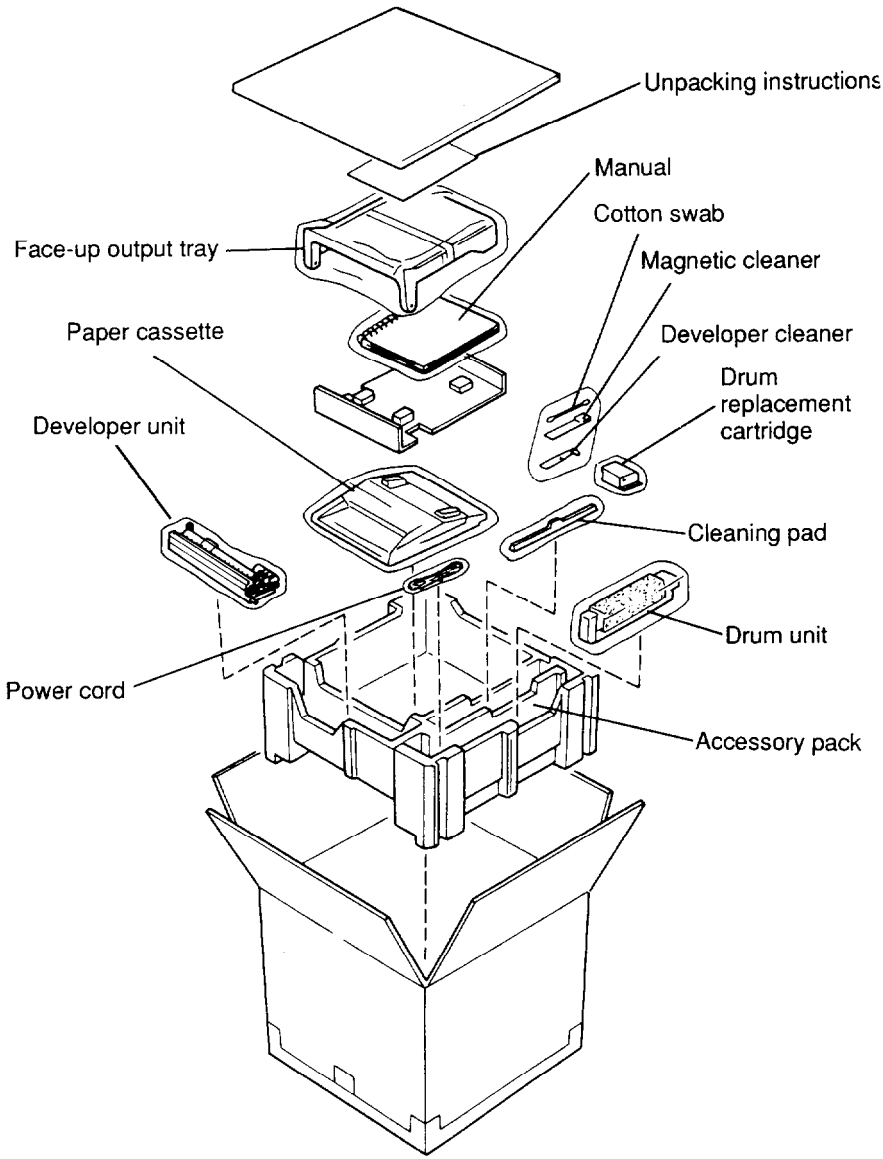
- Avoid locations that are subject to direct sunlight, excessive heat, moisture, or dust.
- Avoid using electrical outlets that are controlled by wall switches or automatic timers. Accidental disruption of power can wipe out valuable information in your computer's memory and your printers memory.
- Avoid using outlets on the same circuit with large motors or other appliances that might disrupt the power supply.
- Keep the entire computer system away from potential sources of interference, such as loudspeakers or the base units of cordless telephones.

Unpacking the Printer

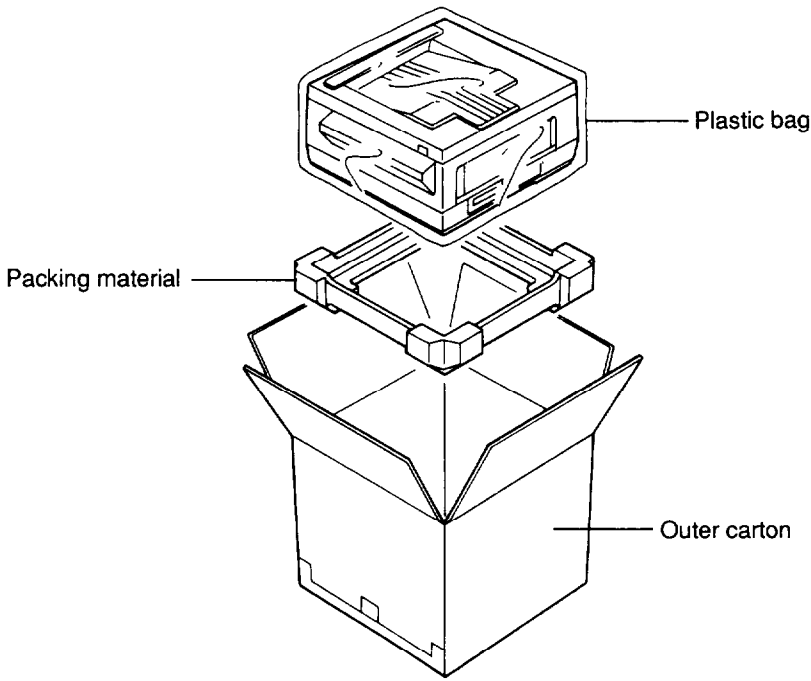
Carefully unpack the outer carton. At the top of the carton is the accessory pack containing several printer components. Beneath the pack is the printer itself, which is protected by white foam packing material.

Note: If you already followed the instructions on your unpacking sheet, skip to the section on carrying the printer.

1. Remove the accessory pack and make sure you have the accessories shown below.



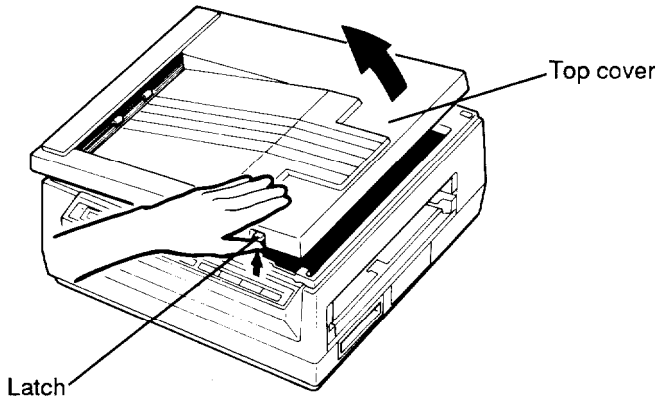
2. Carefully remove the printer from the outer carton, lifting the printer by the recesses on each side of it. Set the printer on a flat, stable surface. Since the printer is heavy, you may need to have someone help you lift it.



3. Remove the white foam packing material and plastic bag protecting the printer. Also remove the plastic bag from the paper cassette.

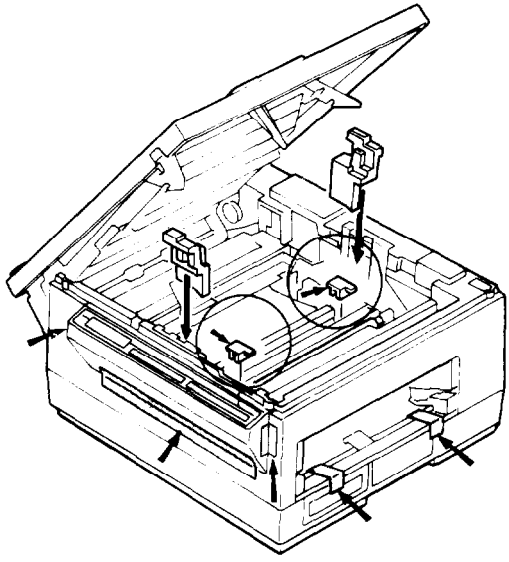
> Note: It is very important to save *all* packing materials. You need to repack the printer in these materials whenever you ship the printer. Chapter 6 has details on transporting your printer.

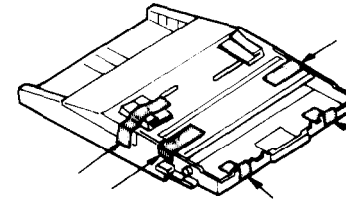
4. Raise the top cover of your printer by lifting up on the latch.



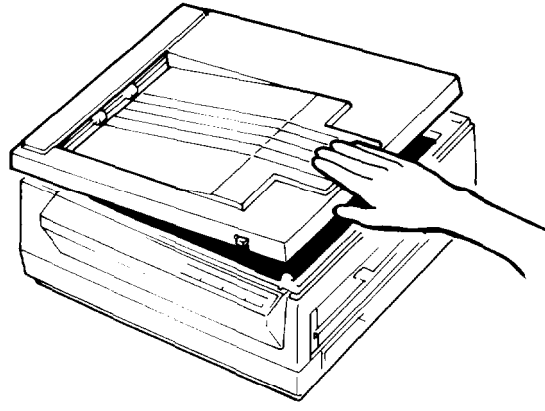
5. Remove the tape and foam from the printer and paper cassette as shown on the next page.

> CAUTION: Be careful to remove all the tape and pieces of foam from the inside and outside of the printer, especially the foam taped inside the printer. Save the foam: you'll need whenever you transport the printer.





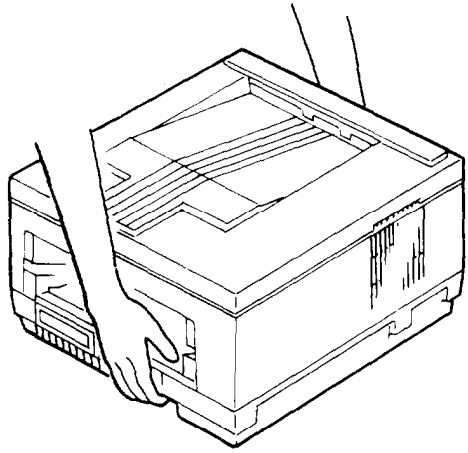
6. To close the cover, push only on the ridged portion of the lid.



Carrying the Printer

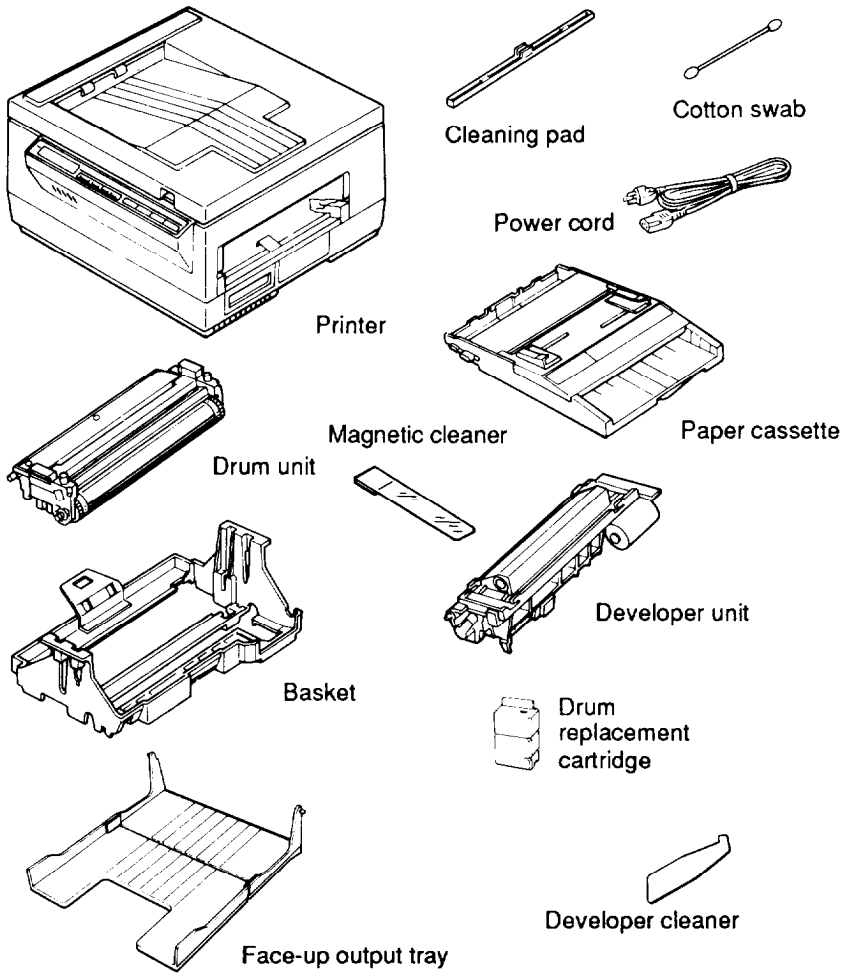
When you move your printer to the location you selected for it, carry the printer by holding the recesses on each side of the printer, as shown below.

Note: The printer weighs about 36 lb. (16 kg) and should be carried with care. You may need to have someone help you lift it.



Assembling the Printer

Before you can use the printer, you need to install a few important parts. Before proceeding, familiarize yourself with the components shown below. The basket is inside the printer and must be removed when you install certain parts. The other parts shown were shipped in the accessory pack.



Note: Put the developer cleaner and magnetic cleaner in a safe place for now. You'll need to use the developer cleaner if vertical white lines appear on your printed pages. The magnetic cleaner is useful for removing excess toner from the paper guide. Usage of these two accessories is described in Chapter 6.

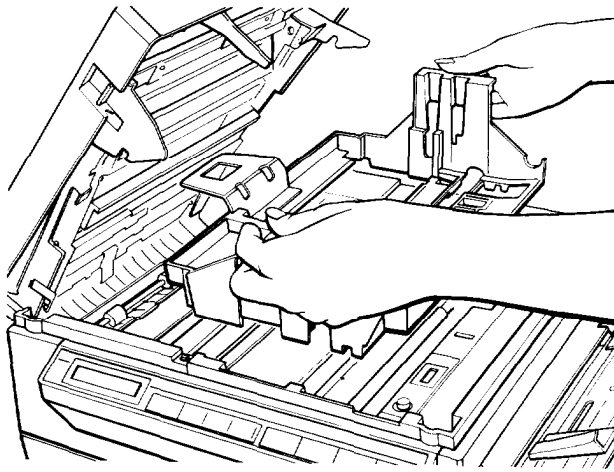
Installing internal components

This section describes how to install internal components, including the drum unit, drum replacement cartridge, cleaning pad, and developer unit.

The drum unit, drum replacement cartridge, cleaning pad, and toner cartridge (which is attached to the developer unit) need to be replaced periodically. See Chapter 6 for details.

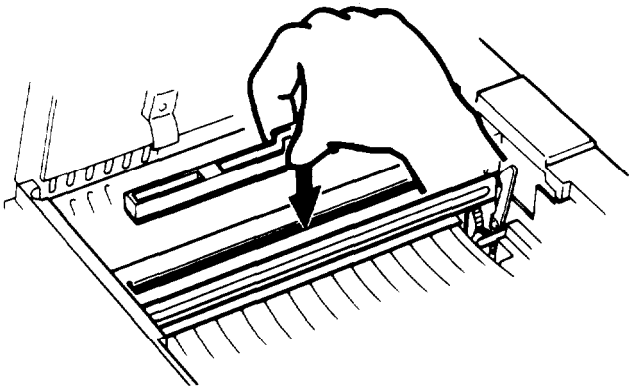
CAUTION: When handling the drum, developer unit, or basket, always set them on a clean, smooth surface. Be sure not to scratch or mar the roller on the developer unit or the surface of the drum. Also avoid touching the drum, since oils from your skin can permanently mar its surface and affect print quality.

1. Raise the top cover of your printer by lifting up on the latch.
2. Remove the basket and place it on a flat surface.



3. Locate the cleaning pad in the accessory pack. Holding the green felt tabs on the cleaning pad, insert the pad into the indentation on the orange-colored fuser on the left side of your printer.

WARNING: Never touch the fuser. When the printer is in operation, the fuser becomes very hot.



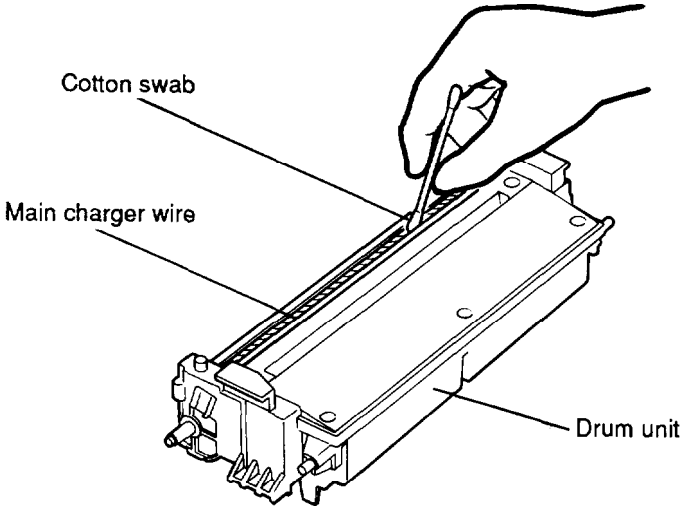
4. Locate the drum unit, which you can recognize by the bright green drum, and the cotton swab.

> CAUTION: Do not expose the photosensitive drum to light any longer (a few minutes at most). It is recommended that you cover the drum with a soft cloth or sheet of paper whenever drum is exposed. Also, do not touch the surface of the drum.

5. Place the drum unit on a clean, smooth surface and locate the main charger wire, which extends along the length of the green drum inside a slot in the silver bar directly over the drum. The wire is silver and very thin, so it is difficult to see.

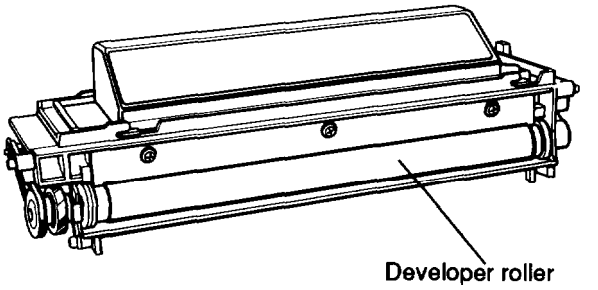
> CAUTION: The main charger wire is very delicate. Do not press on it too hard or it may break. Also, never touch the wire.

6. Gently clean the main charger wire with the cotton swab by rubbing the swab along the length of the wire. You need to insert the cotton swab a fraction of an inch into the slot to reach the wire.

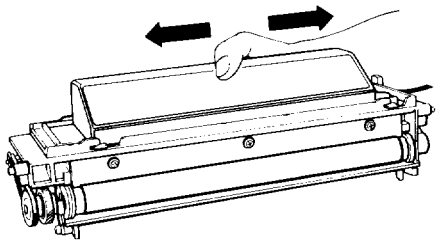


7. Set the drum unit aside for a moment and locate the developer unit, which is labelled: Initial Toner Cartridge.

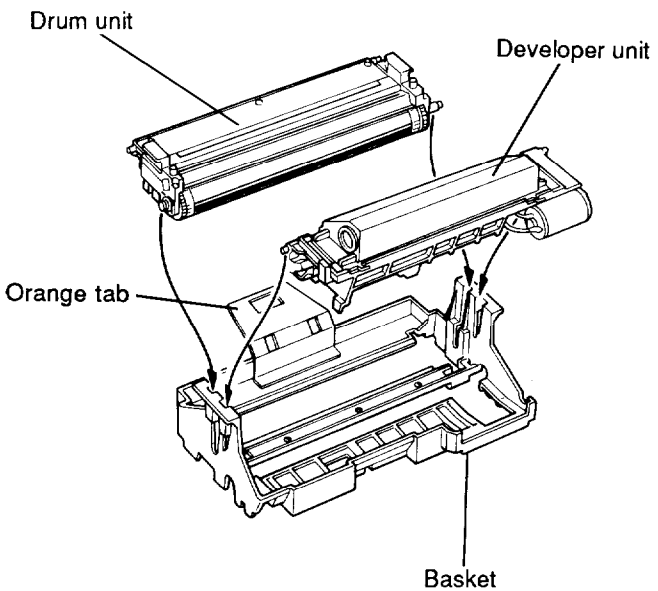
CAUTION: Do not touch the roller on the developer unit.



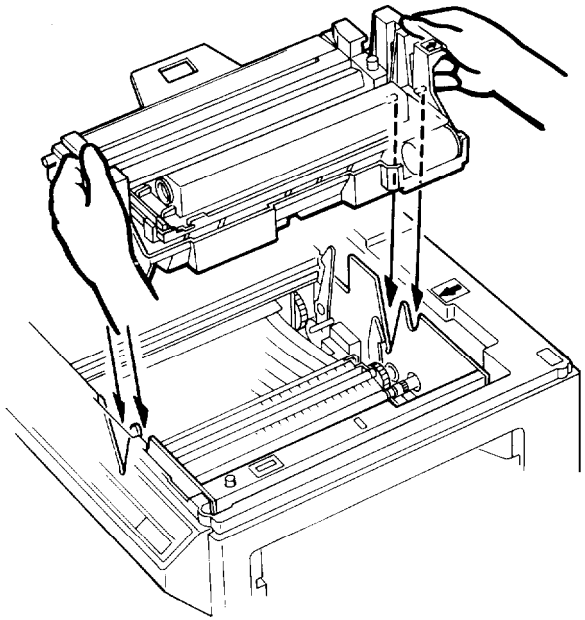
8. Hold the developer unit horizontally, with the toner cartridge label right side up. Gently shake the unit back and forth a few times to distribute the toner.



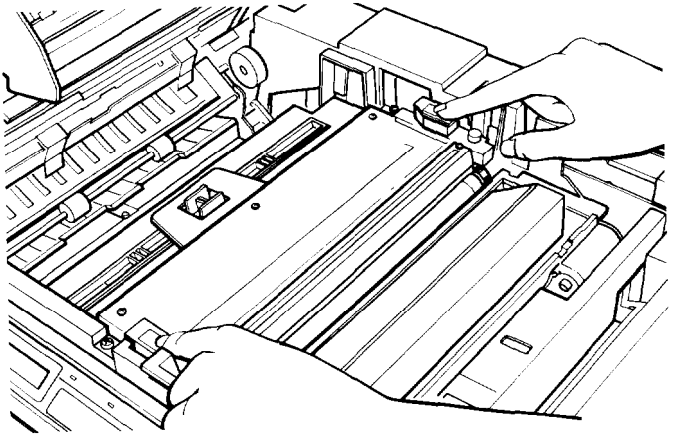
9. Install the drum unit (lifting it by its green handles) and the developer unit in the basket. The drum unit goes closer to the orange tab.



10. With the top cover of the printer open, align the blue arrow on the right side of the basket with the blue arrow on the printer case. (The arrows point toward each other **when the** unit is properly installed.) Gently lower the basket into place.

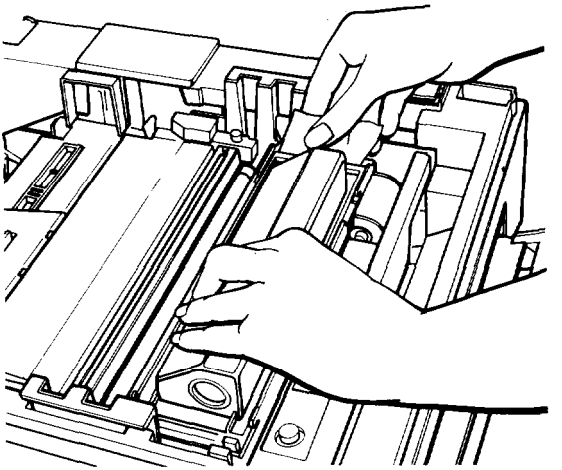


11. Press down simultaneously on the drum unit's two green handles until the drum unit clicks into place.

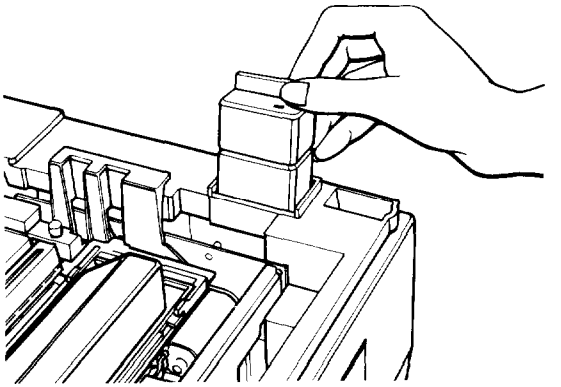


12. Unfasten the tape holding the clear plastic film in place on the initial toner cartridge, which is attached to the developer unit.

13. Pressing down on the toner cartridge to hold it firmly in place, pull out the film. (Pull the film up and out toward the back of the printer.) Pull firmly until the other end of the film comes out of the cassette.



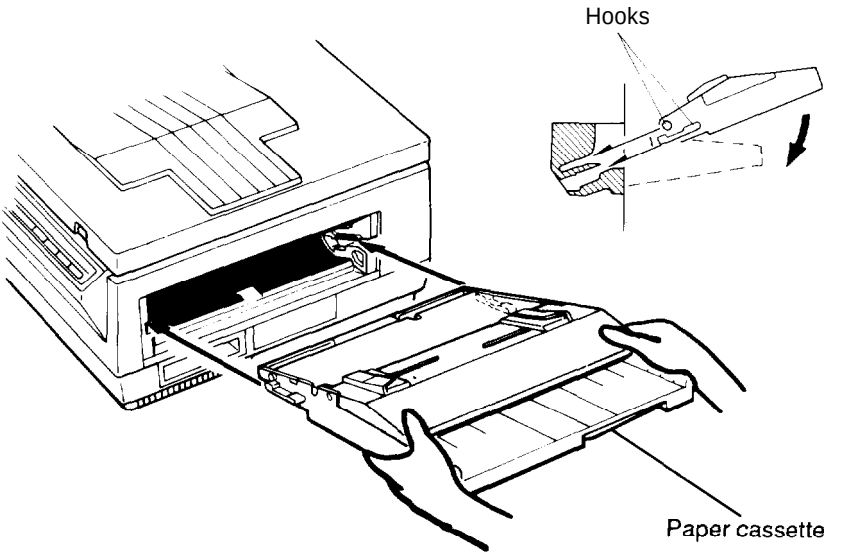
14. Insert the drum replacement cartridge in the slot at the right rear comer of the printer frame (with the printer cover open). Make sure that the indicator light faces the front of the printer. Press down on the cartridge until it is inserted all the way.



15. Now close the printer cover by pressing down on the ridged area on the right side of the cover.

Installing the paper cassette

1. Locate the paper cassette opening on the right side of the printer. Align the hooks on either side of the paper cassette with the slots in the opening. Make sure you have removed any tape in the opening.



2. Insert the paper cassette into the printer in the direction of the arrow on the side of the cassette. Push the cassette in until it goes no further, then lower the end of the cassette (the end you insert paper into) until the cassette drops into place.

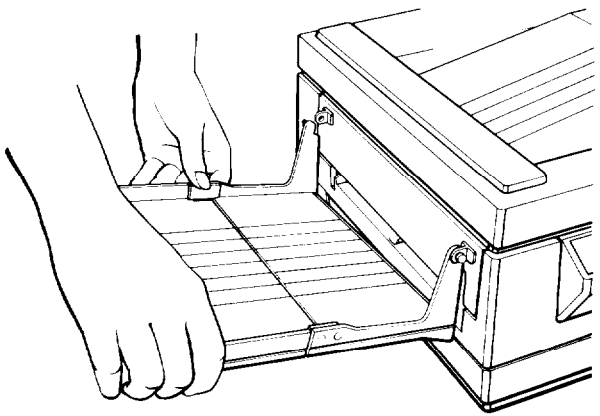
CAUTION: It is particularly important to lower the cassette into place. If the paper cassette is not installed properly, the control panel may display a PAPER EMPTY error.

Installing the face-up output tray

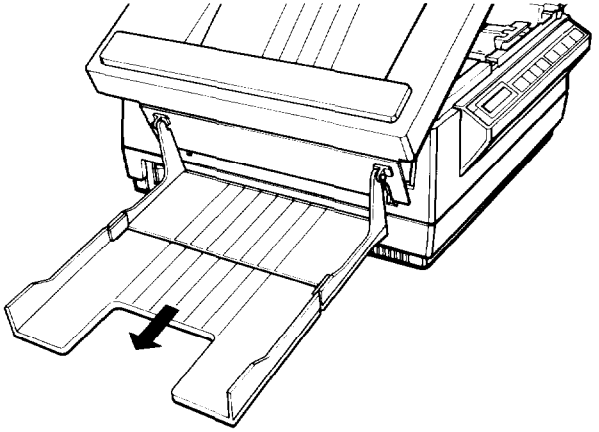
The face-up output tray lets you print heavier paper and other media requiring a straight paper path. (See Chapter 4 for details.) The face-up output tray also lets you view your printed output the moment it comes out of the printer.

If you wish to install the faceup output tray, follow these steps:

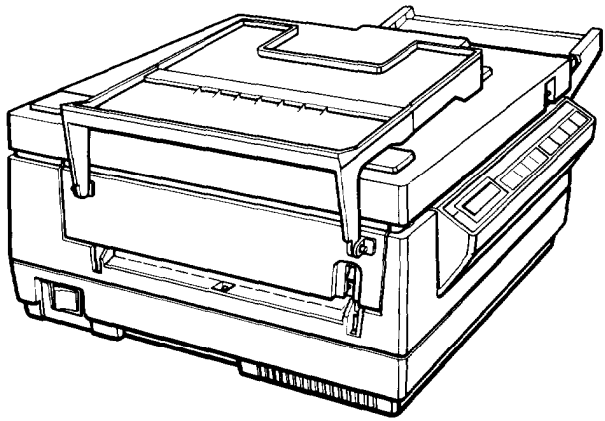
1. Locate the two face-up output tray hooks on the left side of your printer.
2. Mount the face-up output tray onto the hooks as shown.



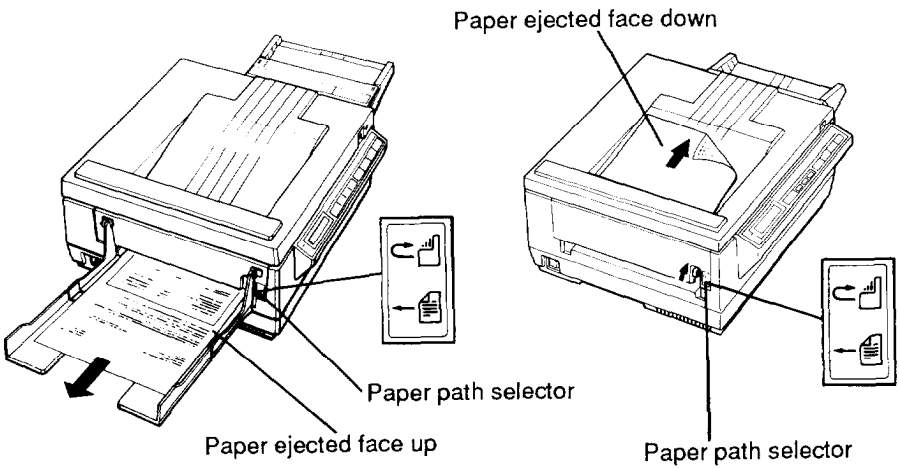
WARNING: When you open the printer cover, the tray touches the desktop and slides to the left of the printer as shown below. Before you install the tray, make sure there is at least 13 inches (330 mm) of unobstructed area to the left of the printer. Otherwise your tray may run into an obstruction and break **when you** open **the** cover.



When it is not in use, you can leave the tray attached to the printer but rotated so that it rests on top of the printer. However, you should lower the tray before you open the printer cover.

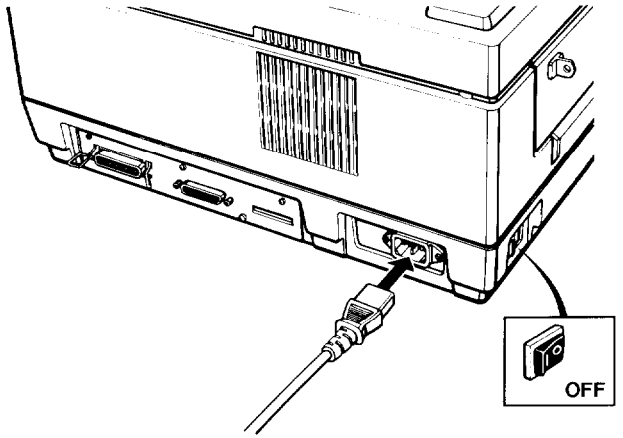


Note: The printer is factory set for face-down output on top of the printer. If you prefer faceup delivery, simply move the paper path selector (located on the left side of the printer) to the down position.



Attaching the power cord

1. Before attaching the power cord, make sure that the power switch on the left side of the printer is turned off. (It is off when **the O** side of **the** switch is pushed down.)



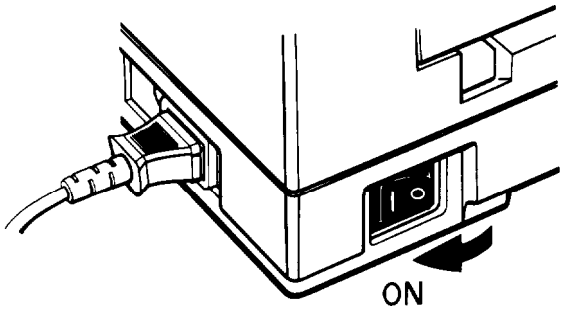
2. Attach **the** power cord to the socket at **the** back of the printer, as shown below. Then plug the other end of the power cord into a properly grounded outlet.

Note: Do not connect the to your computer until the next chapter.

Setting the paper feed mechanism

Follow the steps below if you are using the printer for **the** first time or if you have just transported the printer:

1. Be sure the printer is turned off; then remove the paper cassette.
2. Turn on the power by pressing the side of the power switch marked with the vertical bar. The power indicator lights and a **PAPER EMPTY** message appears.



3. Wait at least five seconds, then turn off the power and reinsert the paper cassette. Push the cassette in until it goes no further, then lower the right side of the cassette (the side you load paper into) until it drops into place.

This procedure causes the paper feed mechanism, which can become misaligned when you transport the printer, to resume its original position. If you do not perform these steps before using your printer for the first time or after transporting your printer, paper jams may result.

Chapter 2

Testing and Connecting Your Printer

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Testing the Printer

The laser printer has three built-in print tests: the self test, font print test, and status print test. These tests let you check the operation of your printer and obtain information on printer status.

It is recommended that you run the self test before you begin using your printer to make sure the printer is operating correctly. This test is also useful for checking the print density setting on your printer. The other two tests, the font print test and status print test, can be run any time you need information on fonts or printer status.

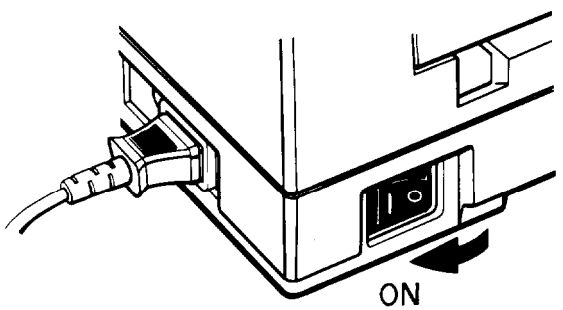
Before running any of these tests, make sure you have removed all protective materials from the printer and that you have installed all components as described in Chapter 1.

> **Note: You** do not need to connect the printer to your computer before running these tests. (Connecting your printer to your computer is described later in this chapter.)

Before performing these tests, it is necessary to turn on the power and load paper as described below.

Turning on the power

1. Make sure the printer is plugged in.
2. Turn on the power by pressing the side of the power switch marked with the vertical bar.



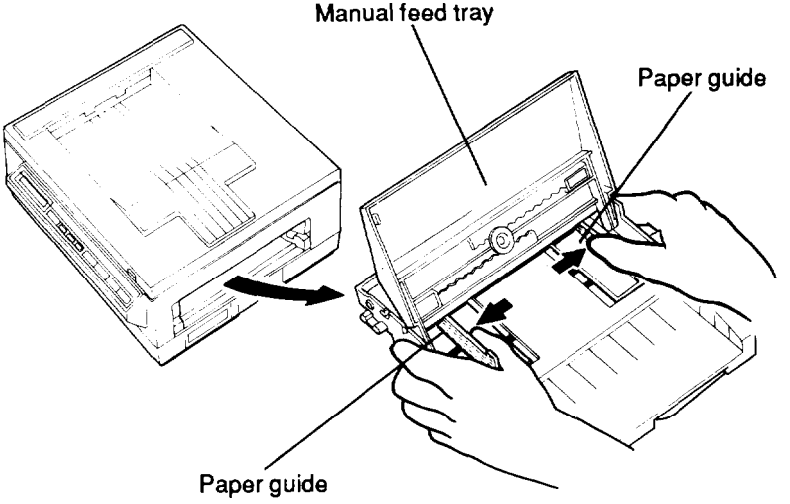
The power indicator lights and a **PLEASE WA I T** message appears while the printer warms up. (It takes about a minute for the printer to warm up.) Then the **PAPER EMPTY** message appears. If **the** display remains blank, see Chapter 7 for troubleshooting information.

CAUTION: After turning off **the** printer, always wait at least five seconds before switching it back **on.**

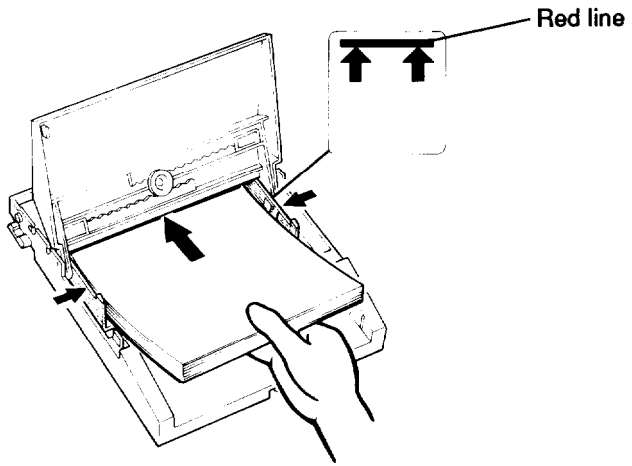
Loading paper

The paper cassette holds up to 150 sheets of 20 lb. paper. To load paper, follow the steps below. See Chapter 4 for more information on paper handling.

1. Remove the paper cassette.
2. Open the manual feed tray on the paper cassette. Slide **the** paper guides all the way apart, as shown below.



3. Take a stack of paper and fan it. Next, tap the edges of the paper on a flat surface to even up the stack.
4. Insert the stack of paper into the paper cassette, making sure that **the** top of the stack does not cover **the** red line inside the paper cassette. **Push** the paper in gently as far as it can go.



5. Slide the paper guides together (if necessary) until they are both resting lightly against the paper.
6. Close the manual feed tray.
7. Reinsert the paper cassette into the printer with the arrow on the side of **the** cassette pointing into the printer. Rush the cassette in until it goes no further and lower the end of the cassette (the end you load paper into) until it drops into place.

CAUTION: It is particularly important to lower the cassette into place. If the cassette is not installed properly, the message **PAPER EMPTY** appears in **the** display.

8. If you are not using letter size paper (the factory default setting for your printer), see the section on SelecType in Chapter 3 for details on setting the correct paper size.

Performing the self test

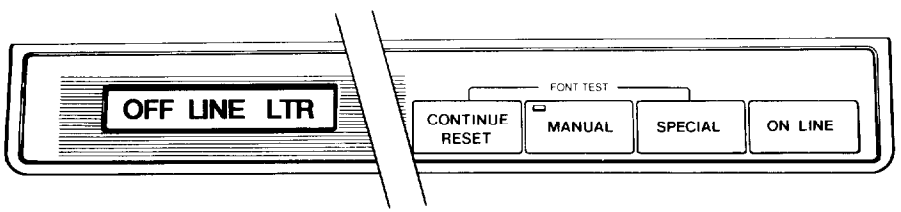
Successful completion of the self test indicates that you have set up your printer correctly and that you are ready to connect the printer to your computer. If you are unable to print this test, see Chapter 7 for troubleshooting information.

The self test also lets you check your print density setting. After you print the self test, check the character pattern to see whether you are satisfied with the print density. The section in this chapter on adjusting print density describes how to change the print density setting.

Follow the steps below to perform the self test:

CAUTION: Never open the cover while the printer is printing.

1. Be sure that your printer is plugged in and the power is on before performing the self test.
2. Be sure that your printer is off line. (OFF LINE appears on *your* display.) If not, press the ON LINE button to set the printer off line.
3. Press the MANUAL and SPECIAL buttons on your control panel at the same time.



4. When you release the buttons, SELF TEST appears on the display and the printer prints **a self** test.

Notes:

- It is important to press the buttons *at the same time.*
- For more information on using the control panel, see Chapter 3.

Part of the character pattern is shown below. Look at your printout to determine whether the print is too light or too dark. If you need to change the print density, see the following section on adjusting print density.

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmno
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvw
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxy
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-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}~
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_'abcdefghijklmnopqrstuvwxyz{|}~#
```
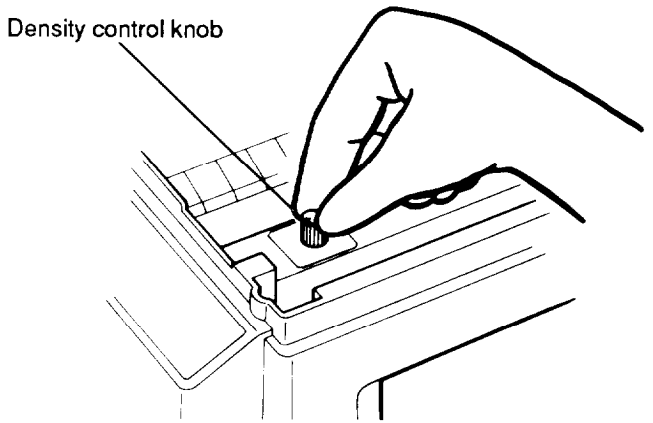

Adjusting print density

If the self test you printed is too light or too dark, adjust the print density as follows:

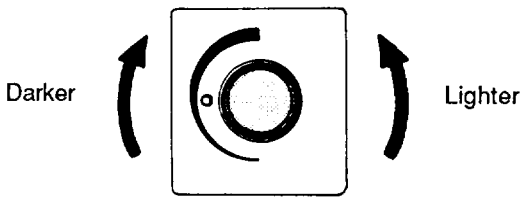
1. Open the printer cover by lifting up on the latch.

2. Locate the density control knob, which is in the front right comer inside the printer.



3. To make the print darker, turn the knob clockwise.

> **Note:** Increasing the print density increases toner consumption. If you increase the print density, you need to replace the toner cartridge more frequently.



4. To make the print lighter, turn the knob counterclockwise.

> **Note:** If you wish to return the print density to the factory default setting, point the arrow on the knob toward the gray dot on the printer case.

5. Close the printer cover.
6. Print the self test again to check the new print density setting. (To print the self test, make sure the printer is off line; then press the **MANUAL** and **SPECIAL** buttons at the same time.)

Performing the font and status print tests

There are two other tests you can perform, in addition to the self test. The font print test gives you information on available HP fonts and the status test lists printer settings. Like the self test, the successful completion of either of **these tests** indicates that you have correctly set up your printer and that you are ready to connect the printer to your computer.

The font print test

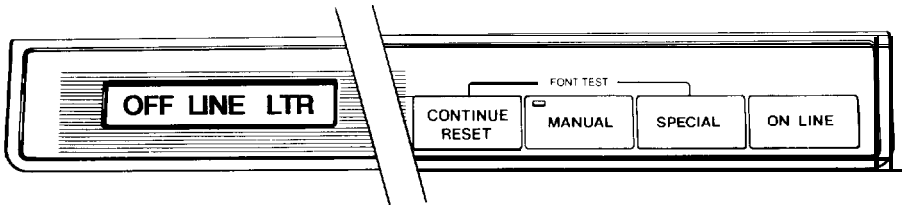
The font print test gives you details **on** available HP fonts, including font source and font ID number, pitch, point size, available symbol sets, and a print sample.

The symbol set ID numbers listed on the font print test (in **the** symbol set column) provide the unique portion of the escape sequence needed to select that particular symbol set. For more information **on** symbol sets, see Appendix A, and for more information **on** escape sequences, see Chapter 5.

Follow the steps below to perform the font print test:

1. Be sure that your printer is plugged in and the power is on.
2. Be sure that your printer is off line. (OFF LINE appears on your display.) If not, press the **ON LINE** button to set the printer off line.

3. To perform the font print test, press the **CONTINUE/RESET** and the **SPECIAL** buttons at the same time.



4. When you release the buttons, FONT **PRINT** appears on the display and the printer outputs a font print test.

A portion of the font print test printout is shown below.

Internal	I00	COURIER	10	12	8U	123ABCabc#$@[\]^'{|}~
	I01	COURIER	10	12	10U	123ABCabc#$@[\]^`{|}~
	I02	COURIER	10	12	11U	123ABCabc#$@[\]^`{|}~
	I03	COURIER	10	12	ON	123ABCabc#$@[\]^`{|}~
	I04	C O U R I E R	10	12	8U	123ABCabc#$@[\]^'{|}~
	I05	C O U R I E R	10	12	10U	123ABCabc#$@[\]^`{|}~
	I06	C O U R I E R	10	12	11U	123ABCabc#$@[\]^`{|}~
	I07	C O U R I E R	10	12	ON	123ABCabc#$@[\]^`{|}~
	I08	LINE PRINTER	16.6	8.5	8U	123ABCabc#$@[\]^'{|}~

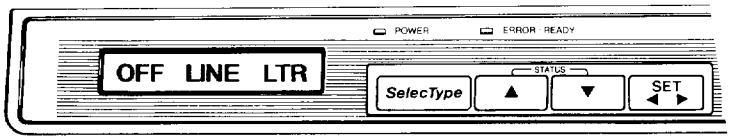
Status print test

The status print test gives you information on current printer settings, such as paper size, number of copies selected, and font source and number.

Follow the steps below to perform the status print test:

1. Be sure that your printer is plugged in and the power is on.
2. Be sure that your printer is off line. (OFF LINE appears on your display.) If not, press the **ON LINE** button to set the printer off line.

3. Press the ▲ and ▼ buttons at the same time.



4. When you release the buttons, ST AT U S PRINT appears on the display and the printer outputs the status print test.

A portion of a sample printout is shown below.

Function & Menu Status			
Paper Size	Letter	Interface	Parallel
Copies	1		
Auto Continue	ON		
Status print	OFF		
Power-ON	ON-LINE		
Data Buffer	2K Bytes		
Over Run Buffer	10 %		
Buzzer	ON		

Current Page Format			
Letter 8.5 x 11 inch			
Vertical		Horizontal	
Page Length	66 Lines	Left Margin	0 columns
Top Margin	3 Lines	Right Margin	80 Columns
Text Length	60 Lines	Current CPI	10 CPI
Current LPI	6 LPI	Printable Chara	80 Characters

Connecting the Printer to Your Computer

For the laser printer to be able to receive and interpret information from your computer, both devices need to be set up so that they can communicate correctly. This requires having the correct interface cable and selecting the right communications settings. You can select from the following built-in interfaces:

- Parallel
- RS-232C serial
- RS-422A serial.

Choosing an interface

When connecting the laser printer to your computer, you first have to determine whether a parallel or serial **connection** should be used. Many computers only provide one type of connection for a printer. If both serial and parallel connections are available, it is normally better to use **the** parallel interface for the printer, leaving the serial port of your computer free for devices such as modems. If you are in **any** doubt about which type of connection to make, consult your computer dealer.

Your printer is set up at the factory for parallel communication. If your computer also uses parallel communication, you should be able to connect up immediately, provided you have a shielded parallel interface cable.

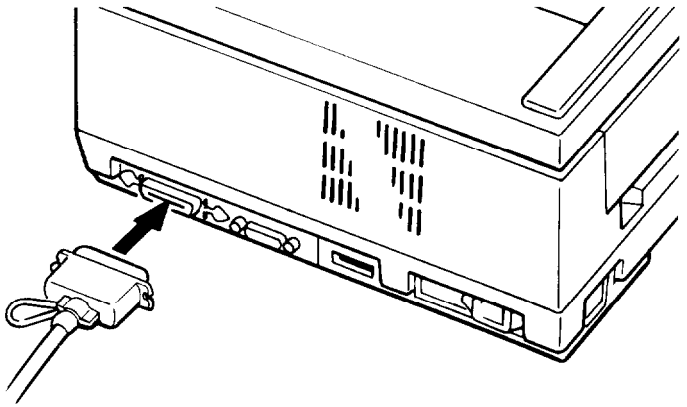
If, however, you find that you need a serial interface, you must change the communications settings with SelecType as described in Chapter 3. You also need to find out which type of serial interface is required by your computer (RS-232C or RS-422A) and set the printer's DIP switches accordingly. (The DIP switches are factory set for the RS-232C serial interface.)

Connecting the parallel interface

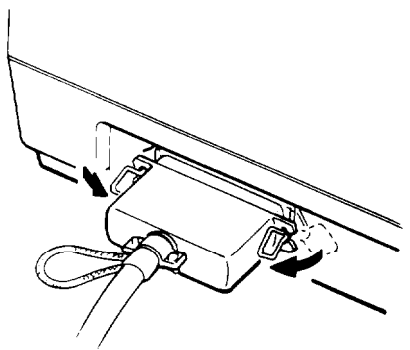
If you are using the laser printer's standard parallel interface, you must use a shielded parallel interface cable.

Follow **these** steps to **connect the** parallel interface:

1. Turn off both your printer and computer.
2. Plug the connector securely into the parallel interface of the printer as shown. (The parallel interface is **the** leftmost connector, if you are facing the back of your printer.)



3. Lock the wire clips together into place on each side of the connector.



4. Plug the other end of the cable into your computer.

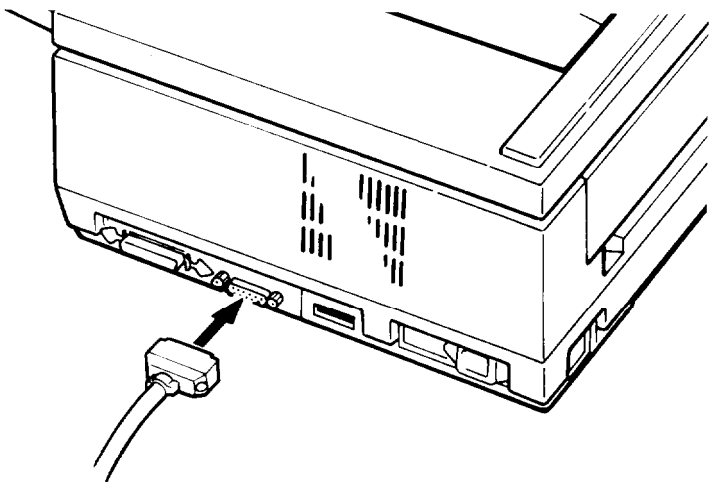
Now that you have connected the parallel interface, see Chapter 3 for information on operating your printer.

Connecting the serial interface

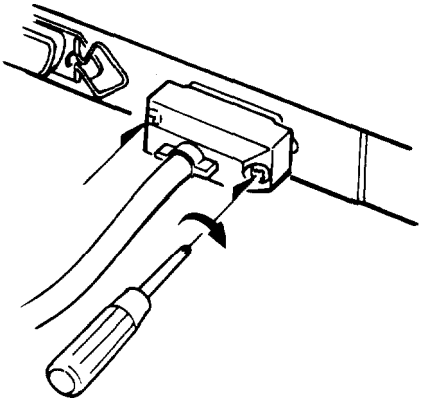
If you are using the printer's serial interface, make sure that you have a properly shielded cable, and **that** it is the correct one for your computer.

Follow these steps to connect the serial interface:

1. Turn off both **the** printer and **the** computer.
2. Plug the cable connector securely into **the** serial interface as shown. (The serial interface is just to the left of the DIP switches if you are facing the back of your printer.)



3. Use a screwdriver to fasten the screws of the connector, if required.



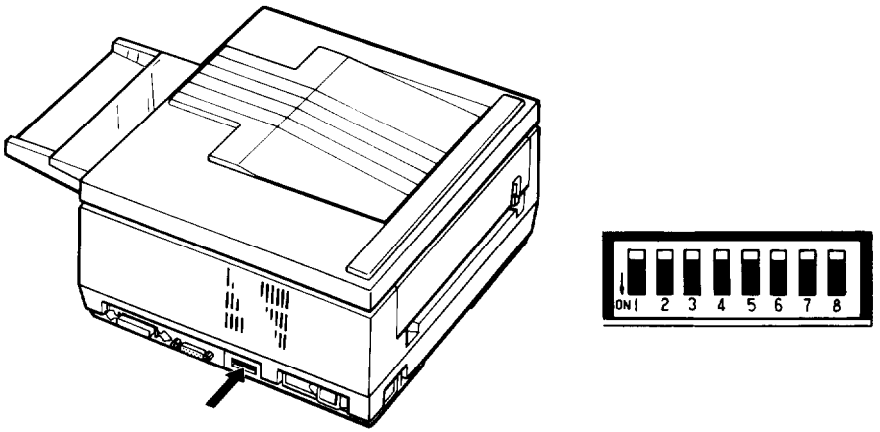
4. Plug the other end of the cable into your computer. (Fasten the screws of the connector to the interface, if required.)

This completes the connection of the serial interface cable. Now you need to set the DIP switches for the type of serial interface you are using.

Setting the DIP switches for the serial interface

The DIP switches are factory set for the RS-232C interface. If you are using the RS-422A interface, you need to change the DIP switches according to the table on the next page.

The DIP switches are located at the back of your printer and are numbered 1 through 8.



The DIP switch settings are listed below. Use the tip of a ballpoint pen or another small pointed object to turn the switches ON or OFF. Pressing a switch down sets it ON and up sets it OFF.

> Note: Turn your printer off before setting the switches. Then turn it back on to implement your changes.

	1	2	3	4	5	6	7	8
RS-232C	OFF	OFF	OFF	OFF	*	OFF	OFF	ON
RS-422A	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF

* If DIP switch 5 is turned ON when the RS-232C serial interface is in use, pin 25 on the connector is set to +5V; if the DIP switch is turned OFF, the pin on the connector is not used.

Now that you have connected the serial interface cable and checked the DIP switches, you need to set the printer for serial communication in SelecType. You may also **need to** change several interface settings, such as baud rate and parity, before your printer and computer can communicate properly. See the SelecType section in Chapter 3 for details on serial interface settings and for other information on operating your printer.

Note: The serial interface settings on your printer must match the serial interface settings on your computer.

Chapter 3

Using the Printer

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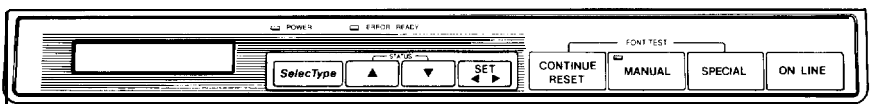
The Control Panel

The control panel on the laser printer gives you control over many printer functions, including interface settings, font selection, and paper size. The control panel is made up of three elements: **a** display, lights, and buttons. The buttons let you select options for SelecType printer'functions, while the indicator lights and the display let you monitor the current status of the printer.



Control panel display

The display on the left side of the control panel lets you monitor the printer's status and view SelecType functions and their available options. The display gives you three types of information, as described below:

- Status messages, which appear in the display as part of the normal operation of your printer, indicate the printer's current status.

  DATA IN BUFFER This message appears after the printer receives data without a form feed command. The printer is waiting to receive more data or a form feed command or for **you to** press the **CONTINUE/RESET** button to print the page.

  FONT PRINT This message appears when you run the font print test, which prints all available fonts in HP emulation.

INITIALIZE	This message appears when you reset printer functions to the original factory default settings. This procedure is described in the section on initializing SelecType in this chapter.
ON LINE [LTRI	This message appears when the printer is on line, ready to receive data. The current paper size is shown on the right (for example, **L TR** for letter size paper).
OFF LINE [LTR]	This message appears when the printer is off line, unable to receive data. The current paper size is shown on the right.
PLEASE WA IT	This message appears for approximately 60 seconds while the printer warms up and completes self-diagnostic checks.
PROCESSING	This message appears while the printer is receiving data and printing. It changes to **ON** LINE before the paper is ejected.
PUSH MANUAL KEY	This message appears during manual printing. See Chapter 4 for instructions on manual feed printing.
RESET	This message appears when you reset printer functions to their SelecType settings.
SELF TEST	This message appears during the self test, which prints a character pattern that lets you check the print density and see whether your printer is operating correctly.
STATUS PRINT	This message appears during the status print test, which gives you information on current printer settings

- Maintenance and error messages inform you of required maintenance or of an existing error condition. For **a** detailed list of maintenance and error **messages,** see Chapter 7.
- SelecType options let you control many printer functions, such as font selection and paper handling. For information on SelecType instructions and messages, see the SelecType section later in this chapter.

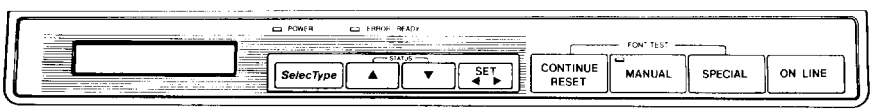
Indicator lights

POWER — On when **the** printer power supply is on.

ERROR — **On** to indicate an error condition. Details of the error condition appear in the display.

MANUAL — Indicates **that** the printer is in the manual paper feed mode.

Buttons



Selec Type — When the printer is off line, use this button to enter or exit SelecType.

UP ▲
DOWN ▼ — In SelecType mode, these two buttons allow you to move through SelecType menus and submenus.

SET
◀ ▶

Press this button to switch from a SelecType function to a list of options for that function and to set SelecType options.

CONTINUE/RESET

This button has several functions.

Printing data in buffer-When the printer is on line and print data is in the buffer and no new data is received within five seconds, the message **DATA IN BUFFER** appears. Pressing the **CONTINUE/RESET** button at that time clears the buffer by printing a page.

Resetting the printer - When the printer is off line, holding this button down for three seconds clears the buffer, resets printer functions to their current SelecType settings, and clears temporary soft fonts and temporary macros. The message **RESET** appears briefly in the display.

Clearing certain error messages - When certain error messages appear in the display, this button can be pressed to clear them and set the printer on line. Pressing this button also overrides paper size messages. See the Error Messages section in Chapter 7 for more information.

The **CONTINUE/RESET** button also has several functions related to SelecType. See the section on the SelecType control panel for details.

MANUAL

When the printer is off line, use this button to alternate between manual and automatic paper feed modes.

SPECIAL Press this button to set a higher fuser temperature. Use this setting for envelopes and heavy (27 through 34-pound) paper. When **this** option is on, a pound sign (#I appears at the right of the display. The default setting is off.

ON LINE Press this button to set the printer on line or off line. This button is disabled in the SelecType mode.

SelecType Overview

The SelecType feature lets you control many of your printer's functions, from the simplest to the most complex.

With SelecType's menu-based system, you can easily change the printer's configuration without DIP switches. (It is necessary to use DIP switches only if you need to select the RS-422A serial interface. See Chapter 2 for details.) Also, SelecType lets you select many font and print functions without software commands.

You can enter the main menu to perform routine printing functions. In addition, you can enter submenus to control serial interface settings and emulation options for HP and FX emulation.

> **Note:** Your application program may send printer commands that temporarily override the emulation submenu settings. If you are not getting the results you expect, check your application software settings.

A brief description of each menu function is given below. See the SelecType Options section in this chapter for a detailed description of each function and its available options. The sections on the control panel and using SelecType explain SelecType operation.

> Note: See the Quick Reference Card at the back of this manual for a map of SelecType menus.

Main Menu	**Interface Submenu**	**HP Emulation Submenu**	**FX Emulation Submenu**
PAPER SIZE	BAUD RATE	FONT SOURCE	ORIENTATION
COPIES	PROT	FONT NUMBER	CONDENSED
AUTO CONT	DATA BIT	FORM	ZERO
EMULATION	PARITY	SYMBOL	INTL CG
I/F	STOP BIT		SKIP-OVER
STATUS PRT	ROBUST-XON		AUTO LF
POWER ON			CG TABLE
DATA BUFFER			TOP OF FORM
OVER LORD			
BUZZER			

SelecType main menu

PAPER SIZE	Specifies the size of the paper.
COPIES	Selects the number of copies to print.
AUTO CONT (Automatic Continue)	Lets the printer continue printing instead of stopping under certain error conditions.
EMULAT I ON	Allows you to select the emulation mode and enter the emulation submenus.
I/F (Interface)	Allows you to set up the printer's interface to conform to the requirements of your computer.
STATUS PRT	Allows you to run the status print test each time the printer is powered on.
POWER ON	Selects either on line or off line mode when the printer is powered on.
DATA BUFFER	Sets the size of the data buffer in kilobytes.
OVER LORD	Selects the data buffer overflow value.
BUZZER	Turns the buzzer on or off.

Interface submenu

BAUD RATE	Sets the data transfer rate.
PROT (Protocol)	Selects the protocol.
DATA BIT	Selects the number of data bits.
PARITY	Selects the parity.
STOP BIT	Selects the number of stop bits.
ROBUST-XON	Turns Robust-Xon on and off.

HP emulation submenu

FONT SOURCE	Sets the default font source location.
FONT NUMBER	Allows you to specify font number based on the font source selected.
FORM (Form Length)	Sets the number of lines that can be printed on the paper.
SYMBOL	Selects a symbol set.

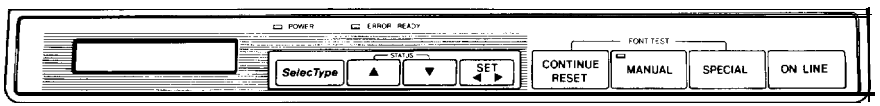
FX emulation submenu

ORIENTATION	Selects portrait or landscape.
CONDENSED	Selects 17 cpi characters.
ZERO	Selects slashed zero.
INTL CG	Selects an international character set.
SKIP-OVER	Creates a top and bottom margin.
AUTO-LF	Selects Auto Line Feed.
CG TABLE	Selects Epson Extended Graphics or italic character table.
TOP OF FORM	Selects a top margin.

The SelecType Control Panel

This section examines the SelecType portion of the control panel and describes the steps necessary to select SelecType functions and change options for each function.

The SelecType portion of the control panel consists of the display, the *SelecType* button, the ▲ and ▼ buttons, and the **SET** button. In addition, the **CONTINUE/RESET** button has several functions in SelecType.



The left side of the display shows SelecType functions. The right side of the display shows the options for each function.

SelecType	Use the *SelecType* buttonto enter and exit SelecType. (After exiting SelecType, you must use the **CONTINUE/RESET** button as described below to implement your changes.)
▲	The ▲ button moves you up a menu or *increases* numeric values.
▼	The ▼ button moves you *down* a menu or *decreases* numeric values.

The main menu works in a loop, so that pressing the ▼ button at the last function takes you around to the first function; pressing the ▲ button at the first function takes you to the last function.

Use of these buttons is described in more detail in the following sections.

CONTINUE/RESET

This button has several uses related to SelecType.

Implementing SelecType changes - After you exit SelecType (with the printer off line), hold down **this** button for three seconds (until the message **RESET** appears) to make your SelecType settings take effect.

Initializing SelecType settings to factory defaults - In SelecType mode, hold down the **CONTINUE/RESET** button for three seconds (until the message INITIALIZE appears). Then hold down the button for three more seconds (until the message **RESET** appears) to return all SelecType functions to the factory settings. See the section on initializing SelecType for full details.

> **CAUTION:** This initializing procedure returns all SelecType options to their factory settings, cancelling all changes you have made. It should be used with care.

SET
◄ ►

Use **the SET** button to select and set SelecType options.

Using SelecType

This section describes how to change SelecType functions. For descriptions of each available option, see the SelecType Options section later in this chapter. You need to perform several basic steps each time you use SelecType. Details follow the list below:

- Enter SelecType
- Display main menu functions
- Enter menu options
- Set an option
- Display submenu functions and select submenu options (if desired)
- Exit SelecType
- Reset the printer **with the CONTINUE/RESET** button.

Details of **each** step are provided below.

Enter SelecType

To enter SelecType, set the printer off line by pressing the **ON LINE** button. Then press the SelecType button. You are now in the main menu, which contains these menu functions:

PAPER SIZE
COPIES
AUTO CONT
EMULATION
I/F
STATUS PRT
POWER ON
DATA BUFFER
OVER LOAD
BUZZER

The left side of the display shows menu functions. The right side shows options for **each** function. An asterisk (*) to the right of an option indicates that it is the current setting.

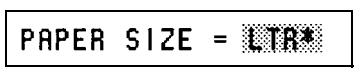
Display main menu functions

As **soon as** you enter the main menu, you see the first function and the current option for that function. The function is blinking. (Blinking functions or options appear shaded in this chapter.)

You can use the ▼ to move down the list of functions; you can use the ▲ to move back up the list.

Enter menu options

Move to the function **you wish to change.** Press the **SET** button to activate the list of options. The menu function stops blinking, and **the** menu option starts blinking, indicating that you **can now choose** an option.



Use the ▼ and ▲ buttons to **move** forward and backward through the various options.

Set an option

When you reach the option you wish to use, press the **SET** button. An asterisk (*) appears next to the option, indicating that it has been set. The option stops blinking and the function starts blinking. To implement your SelecType changes, see the section on exiting SelecType later in this chapter.

If you want to return to the menu functions *without* setting a new option, make sure the current option (the one with the asterisk) appears in the display. (If necessary, use the arrows to move to the current option.) Press the **SET** button. The option stops blinking and the menu function begins blinking. You can now move to a new function.

Display submenu functions and select options

When you want to enter the emulation or interface submenus from the SelecType main menu, follow the steps described below.

> **Note:** Options for each function are described in the SelecType Options section later in this chapter.

HP and FX emulation submenus

To enter the emulation submenu, follow the steps described below:

1. Press the ▲ or ▼ button until you see the **EMULATION** function in the display.
2. Press the **SET** button to switch to the current option.
3. If necessary, use the ▲ or ▼ button to select the option you prefer, HPLJ2 or **FX.** The example below shows **HPLJ2.**

```
EMULATION = HPLJ2*
```

4. Press the **SET** button again to set the emulation.
5. Press the **SET** button a third time to enter **the** emulation submenu, where **you** can **change these** options:

FONT SOURCE	**ORIENTATION**
FONT NUMBER	**CONDENSED**
FORM	**ZERO**
SYMBOL	**INTL CG**
	SKIP-OVER
	AUTO LF
	CG TABLE
	TOP OF FORM

6. Use **the** ▲ or ▼ button to select a function to change.

> Note: This submenu does not work in a loop. Pressing the ▲ button when the first item is displayed or the ▼ button when the last item is displayed causes you to exit **the** emulation submenu and return to the main menu.

7. Press the **SET** button to activate the option. The function stops blinking, and the option starts blinking.
8. Use **the** ▲ or▼ button to move to the option you want to set.
9. Press the **SET** button. An asterisk (*) appears next to the option, indicating that **the** new option has been set. The option stops blinking; the function starts blinking.
10. To exit the emulation submenu and return to the main menu, use the ▲ or▼ button to take you back to the main menu. The message **EMULATION = HPLJ2*** or **FX*** appears.

    If you wish to exit SelecType at this point, see the section on exiting SelecType later in this chapter.

Interface submenu

To enter the interface submenu from the main menu, follow the steps below:

1. Press the ▲ or ▼ button until you see the I/F function in the display.
2. Press the **SET** button to activate the menu option. (The option starts blinking, indicating that it has been activated.)
3. If the **I/F** function is set to the **PARALLEL** option, press the ▼ button to select the **SERIAL** option.
4. Press the **SET** button to set the **SERIAL** option. An asterisk (*) appears next to **SERIAL.**

   ```
   I/F = SERIAL*
   ```

5. Press the **SET** button a third time to enter the interface submenu, where you can change options for the menu functions listed below. (The SelecType Options section in this chapter describes options for these functions in detail.)

   BAUDI RATE
   PROT
   DATA BIT
   PARITY
   STOP BIT
   ROBUST-XON

6. Use the ▲ or ▼ button to move to a function you want to change.

> Note: This submenu does not work in a loop. Pressing the ▲ button when **BAUD RATE** is displayed or pressing the ▼ button when **ROBUST-XON** is displayed causes you to exit the submenu and return to the main menu.

7. Press the **SET** button to activate **the** option. The function stops blinking, and the option starts blinking.
8. Use **the** ▲ or▼ button to move to the option you want to set.
9. Press the **SET** button. An asterisk (*) appears next to the option, indicating that the new option has been set. The option stops blinking and **the** function starts blinking.
10. To exit the emulation submenu and return to the main menu, use **the** ▲ or▼ button to take you back to **the** main menu. The message **I/F** = SERIAL* appears in the display.

If you wish to exit SelecType at this point, see the section below on exiting SelecType.

Exit SelecType and reset the printer

To exit SelecType (from any main menu or submenu function) and implement your changes, follow these steps:

1. When you have set all the options you want, press the *SelecType* button. The printer is set off line.
2. Hold down the **CONTINUE/RESET** button for three seconds (until **the** message **RESET** appears) to implement your changes. The options are implemented in the printer's **memory** until you change them or initialize them to the factory settings.

> Note: To implement changes to **the DATA BUFFER, OVER LOAD,** and interface submenu settings you must also turn the printer off. Remember to leave the printer off for at least five seconds before turning it back on.

Initializing SelecType to factory default settings

To initialize SelecType options, returning them to the factory settings, follow the steps below. (Factory settings are marked with an asterisk (*) in the SelecType Options section.)

1. Press the **ON LINE** button to set the printer off line.
2. Press the *SelecType* button to enter SelecType. This message appears:

   ```
   PAPER SIZE = LTR*
   ```

3. **Hold down** the **CONTINUE/RESET** button for three seconds until the message **INITIALIZE** appears in the display.
4. Your printer is set off line. This message appears in the display:

   ```
   OFF LINE LTR
   ```

5. Hold down the **CONTINUE/RESET** button for three more seconds until the message **RESET** appears in the display.
6. Your printer is set on line. This message appears in the display:

   ```
   ON LINE LTR
   ```

7. If initializing SelecType changes your DATA **BUFF E R, OVER LOAD,** or interface submenu settings, you should also turn off the printer to save these settings. (Remember to wait for at least five seconds before turning the printer back on.)

SelecType practice example

To better understand how to use SelecType, you may want to try this example.

Turning off the buzzer

This example shows how to turn off the buzzer.

1. **Press** the *SelecType* button to enter SelecType. This message appears:

PAPER SIZE = LTR*

2. Press the ▼ button nine times or simply press **the** ▲ button once, until the **BUZZER** = **ON*** appears in the display. The word **BUZZER is** blinking.
3. Press the **SET** button to move to the list of buzzer options. The word **ON** starts blinking.
4. Press the ▼ button to move to **the OFF** option.

BUZZER = OFF

5. Press the **SET** button to set **the** option. The asterisk (*) now appears next to the word OFF. The word BUZZER starts blinking again.

BUZZER = OFF*

   Now exit SelecType by pressing the *SelecType* button. Then hold down **the CONTINUE/RESET** button for three seconds until **RESET** appears in the display.

SelecType Options

This section describes in detail each SelecType menu option.

Main menu options

When you enter the SelecType main menu by setting the printer off line and pressing the *SelecType* button, you can change any of the menu functions listed below:

PAPER SIZE
COPIES
AUTO CONT
EMULATION
I/F
STATUS PRT
POWER ON
DATA BUFFER
OVER LOAD
BUZZER

Options for each menu function are described below. An asterisk (*) is shown to the right of the factory default setting.

PAPER SIZE = LTR*	LTR*
	LGL
	A4
	EXEC

The four paper size options are listed below:

LTR	Letter size paper (8.5 x 11 inches)
LGL	Legal size paper (8.5 x 14 inches)
A4	European style (210 x 297 mm)
EXEC	Executive (7.25 x 10.5 inches)

COPIES = 01*	01 through 99

You can change the setting to print between one and 99 copies of each page.

AUTO CONT = ON*	**ON***
	OFF

When this option (automatic continue) is on, your printer automatically continues printing after a 10 second pause when one of the following errors occurs: paper size, error 20 **(memory** overflow), error 21 (page too complex), error 22 (communication error), and error 40 (parity/baud rate error). When this option is off, **you** must press the **CONTINUE/RESET** button to continue printing. See Chapter 7 for details on error messages.

EMULATION = HPLJ2*	**HPLJ2***
	FX

This option allows you to enter **the** HP or FX emulation submenu (described in the following sections).

I/F = PARALLEL*	**PARALLEL***
	SERIAL

This option selects the printer interface. When **the** serial interface is set, this option is used to enter the interface submenu (described later).

STATUS PRT = OFF*	**ON** **OFF***

When this option is on, a status print test is run each time the printer is powered on. See Chapter 2 for information on this print test.

POWER ON = ON LINE*	**ON LINE*** **OFF LINE**

When this option is set to on line, **the** printer is set on line after you turn on the printer. In the off line setting, the printer is set off line after you turn on the printer.

DATA BUFFER = 02*	01 through 99

This option sets the size of the data buffer in kilobytes.

OVER LORD = 10*	01 through 40

This option selects the printer's data buffer overflow value. The options are percentages.

BUZZER = ON*	**ON*** **OFF**

When this option is **on, a** buzzer sounds when a printer error occurs. When the option is turned off, the buzzer does not sound.

HP emulation submenu options

When you enter the HP emulation submenu, you can access any of the menu functions listed below. Accessing this submenu is described in the section on displaying submenu functions.

FONT SOURCE
FONT NUMBER
FORM
SYMBOL

Options for each function are described below. An asterisk (*) is shown to the right of the factory default option.

FONT SOURCE = I*	**I ***
	1
	S

This option selects the printer's font source. The options are listed below:

I	Internal font
1	Cartridge slot
S	Downloadable soft font

Note: Only available options appear on your display.

FONT NUMBER = 00*	00 through 99

This option selects the printer's font number, based on the font source option selected above. For a list of available fonts and font ID numbers, print the font print test as described on page 2-8.

FORM = 060*

005-128

This option sets **the** form length **(the** number of lines printed on each page).

SYMBOL = ROMAN8*

ROMAN8*
ECMA-94 (Latin 1)
IBM-US
IBM-O N (Danish / Norwegian)
I SO2 (International Reference Version)
ISO4 (United Kingdom)
ISO6 (ASCII)
ISO10 (Swedish)
ISO11 (Swedish)
ISO14 (JIS ASCII)
ISO15 (Italian)
ISO16 (Portuguese)
ISO17 (Spanish)
ISO21 (German)
ISO25 (French)
ISO57 (Chinese)
ISO60 (Norwegian 1)
ISO61 (Norwegian 2)
ISO69 (French)
ISO84 (Portuguese)
ISO85 (Spanish: IBM)
GERMAN
SPANISH

This option sets the symbol set. A symbol set is a unique group of available characters, Each symbol set is designed to meet the needs of a specific application. See Appendix A for details.

FX emulation submenu options

When you enter the FX emulation submenu, you can access any of the menu functions listed below. Accessing this submenu is described in the section on displaying submenu functions.

ORIENTATION	**SKIP-OVER**
CONDENSED	**AUTO LF**
ZERO	**CG TABLE**
INTL CG	**TOP OF FORM**

Options for each function are described below. An asterisk (*) is shown to the right of the factory default option.

ORIENTATION = P*	**P***
	L

The orientation option selects **the** direction in which the characters are printed on the page, either portrait **(P)** or landscape **(L).**

CONDENSED = OFF*	**OFF***
	ON

This option selects condensed printing. When the option is set to **OFF,** the printer prints at 10 characters per inch (cpi). When it is set to **ON,** the printer prints at 17 cpi.

Note: Condensed printing selects **the** smaller, Line Printer font. See Appendix A for a character sample.

ZERO = UNSLASHED*	**UNSLASHED***
	SLASHED

When this option is **set to SLASHED the** zero character prints with a slash through it (0). This option is useful for clearly distinguishing between the uppercase letter O and zero when printing documents such as program lists.

INTL CG = USA*

USA*
FRANCE
GERMANY
UK
DENMARK
SWEDEN
ITALY
SPAIN

This option selects the international character set. The capability to select an international character set provides you with a range of characters and symbols used in other languages.

Twelve character codes between decimal 35 and 126 can represent different characters depending on the international character set you select.

The table below shows the 13 available international character sets. The countries 0 through 7 are available through this SelecType option; 8 through 12 are available only through **the** ESC R printer command. See Chapter 5 for information **on** printer commands.

International character sets

	35	36	64	91	92	93	94	96	123	124	125	126
0 USA	#	$	@	[	\	]	^	`	{	¦	}	~
1 France	#	$	à	°	Ç	§	^	`	é	ù	è	¨
2 Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3 UK	£	$	@	[	\	]	^	`	{	¦	}	~
4 Denmark I	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5 Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6 Italy	#	$	@	°	\	é	^	ù	à	Ò	è	ì
7 Spain I	₧	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
8 Japan	#	$	@	[	¥	]	^	`	{	¦	}	~
9 Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10 Denmark II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11 Spain II	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
12 Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú

SKIP-OVER = ON*	ON* OFF

This option allows you to select skip perforation. When set to **ON,** a margin is created between **the** last line printed on **one** page and the first line printed on the next page. This feature is helpful if your application program does not provide top and bottom margins. If set to **OFF,** data may be lost between **the** last line printed on one page and the first line printed **on the** next page.

AUTO LF = CR*	CR* CR + LF

This option selects whether or not a line feed (LF) code is added to each carriage return (CR) code. Since many computers and application programs automatically add line feeds to carriage returns, the setting you use depends on your computer and application software. If your printing has an extra space between lines, select **CR.** If your printed **lines** are on top of each other, select **CR + LF.**

CG TABLE = ITALIC*	ITALIC* GRAPH

This option allows you to select **the** Epson Extended Graphics character table **(GRAPH)** or the italics character table **(ITALIC).**

The Extended Graphics character table **contains** international accented characters, Greek characters, and character graphics for printing lines, comers, and shaded areas. If you have an IBM® computer or an IBM compatible, select the Epson Extended Graphics table when you **wish** to print the character graphics as they are displayed on the screen.

Since the character table setting affects only half of the character table, you can still print text if you have selected the Extended Graphics set. Also, the ESC 4 command can be used to turn on the italic mode even if you have selected the Epson Extended Graphics character table.

The printouts below show which characters are printed in each table. For a chart showing the characters and their hexadecimal and decimal codes, see Appendix A.

Italics

!"#$%&'()+,-./0123456789:;<=>?@ABCDEFGH*
IJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
rstuvwxyz{|}~

Epson Extended Graphics

TOP OF FORM = 03* 00 through **12**

This option sets the top margin in 1/12-inch increments within the printable area. The printable area of each page begins 1/4 inch from the top of the page. This option adds to that 1/4 inch margin. If 00 is set, for example, there is a 1/4 inch top margin. If 12 is set, there is a 1-1/4 inch top margin.

Interface submenu options

The interface submenu is used to set options for the serial interface. If you are using a serial interface, the options listed below should be set so that they match the requirements of your computer.

BAUD RATE
PROT
DATA BIT
PARITY
STOP BIT
ROBUST-XON

Options for each menu function are described below. An asterisk (*) is shown to the right of the factory default setting.

BAUD RATE = 9600*	**19200** **9600*** **4800** **2400** **1200** **600** **300**

This option sets the rate data is transferred from the computer to the printer. The computer and printer must be set to the same baud rate.

PROT = RDY/BSY(H)*	**RDY/BSY(H)*** **RDY/BSY(L)** **XON/XOFF**

This option sets printer's communication protocol. A communication protocol keeps the computer from sending more information than **the** printer can handle. Most computers require RDY/BSY set to high. The RDY/BSY option is also referred to as DTR POLARITY.

DATA BIT = 8*	8* 7

This option sets the number of data bits in each character of information sent to the printer.

PARITY = NONE*	NONE* ODD EVEN IGNORE

This option sets the parity bit, which provides a basic form of error detection.

STOP BIT = 1*	1* 2

This option sets the number of stop bits on each character of information sent to the printer. Stop bits signal the end of a character.

ROBUST-XON = ON*	ON* OFF

When this option is set to ON, additional Xon's are transmitted at one-second intervals until data is received. Only one Xon is transmitted when this option is set to OFF. This option should normally be set to ON, since most computers run using the ON setting.

Chapter 4

Paper Handling

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4

Selecting Paper

With the laser printer, you can print on many sizes and types of paper. You can also use other media, such **as** envelopes, labels, and overhead projector transparencies. The printer feeds most types of paper automatically from the paper cassette, while special print media and special paper require manual feeding for greater control.

The type of paper you use in the printer directly affects the quality of the material you print.

A printed image is made up of many tiny dots of toner. If the paper is rough, the edges of the letters become ragged because some of the dots fall into indentations on the paper. The smoother the paper used, the better your printing will look.

You should use especially smooth paper for printing originals that will be used to make reproductions. Because reproduction introduces its own raggedness to the edges of the letters, you want to start with the best originals possible.

Below are some recommendations for selecting paper and other print media for your printer.

> **Note:** Since the quality of a particular paper may be changed by the manufacturer at any time, Epson cannot guarantee any particular brand or type of paper. Be sure to test samples of paper stock before purchasing large quantities or printing large jobs.

Standard office paper - You can use the paper cassette to automatically feed most types of 16 to 27 lb. (60 g/m^2 to 101 g/m^2) paper. This typically includes such paper as copier paper, memo sheets, cotton bond, and letterhead. If you feed paper manually through the manual feed slot, you can use 14 to 34 lb. (52 g/m^2 to 128 g/m^2) paper.

For best results, use paper made especially for laser printers. Paper made for plain-paper copiers is also a good choice.

If you want to use less expensive paper, test it thoroughly before regular use. Paper should be of good quality, relatively smooth, and readily available. Also, keep in mind that if the paper is textured or too rough, your printed output may not be as clear.

Do not use paper that is sensitive to silicon oil.

Special paper - You can use colored or three-hole punched paper as long as it meets the weight limits given above for standard office paper. However, do not use coated paper.

Labels - Use only labels designed for laser printers or plain-paper copiers in your printer. When printing labels, you should use the faceup output tray; this keeps the labels from curling or coming off their backing sheet. (Face-up printing is described in the section on paper delivery choices.)

To prevent the adhesive from coming into contact with printer parts, use only labels that completely cover the backing sheet so that there are no gaps.

You should also test the label sheet for leaking adhesive by pressing an ordinary sheet of paper on top of a sheet of labels. If the paper sticks at all, the labels should not be used.

Other materials - You can use overhead projector transparencies and adhesive drafting film if they are made for use with plain-paper copiers or laser printers. These materials should be ejected face-up into the face-up paper tray.

Selecting a Paper Size

The default paper size setting in SelecType is LTR for letter-size paper. If you are using a different size paper, change the PAPER SIZE setting in SelecType. You may also need to adjust the paper guides on the paper cassette to match the size of the paper you want to use.

The table below lists all of the paper sizes on the SelecType menu.

LETTER	8.5 x 11 inches
LEGAL	8.5 x 14 inches
A4	210 x 297 mm
EXECUTIVE	7.25 x 10.5 inches

Printing Methods Summary

You have several choices to make when printing. These choices depend mainly on the type of paper or other print media you use.

Paper delivery method - You can **choose** between face-up output and face-down output.

Paper feed method - You can select either automatic or manual paper feed.

SPECIAL button - You should press **this** button before printing envelopes or heavy paper.

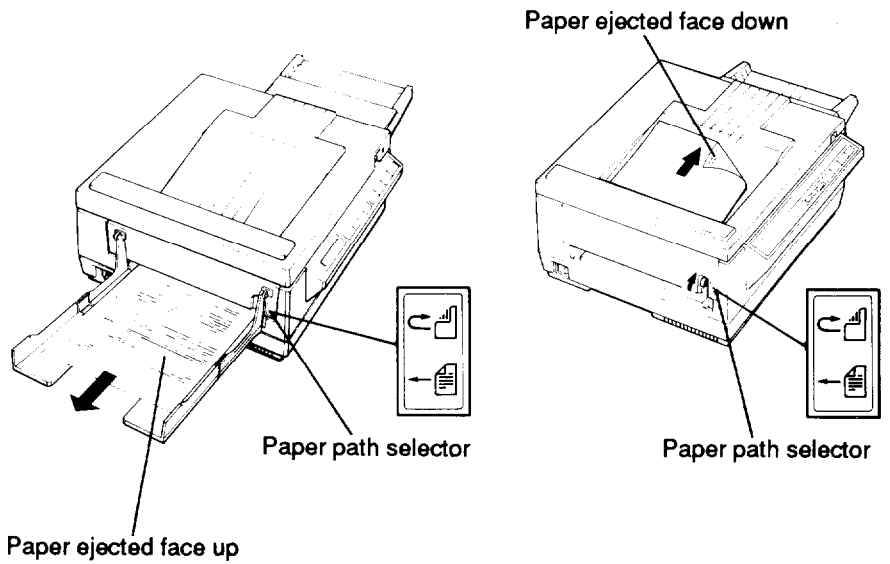
The following table **shows** recommended settings for different print media. (If you wish to try other settings, be sure to test print a few sheets before regular use.) Paper feed and paper delivery methods are described in the following sections.

	Paper Feed	SPECIAL Button	Paper Delivery
Thin Paper (14 - 16 lb.) (52 - 60 g/m^2)	Manual	No	Face-up or Face-down
Regular Paper (16 - 27 lb.) (60 - 101 g/m^2)	Auto	No	Face-up or Face-down
Heavy Paper (27 - 34 lb.) (101 - 128 g/m^2)	Manual	Yes	Face-up
Envelopes	Manual	Yes	Face-up
Transparencies	Manual	Optional	Face-up
Labels	Manual	Optional	Face-up

Paper Delivery Choices

Your laser printer can deliver paper face-down on top of the printer or face-up into the faceup output tray. The advantage of printing face-down is that when the printed stack is turned over, the pages are collated from first page to last. On the other hand, the face-up output tray gives you immediate viewing of your printed output. The face-up method of delivery is necessary for printing on media that require a straight-through paper path, such as envelopes, labels, heavy paper, and overhead transparencies.

To select faceup printing, simply move the paper path selector (located on the left side of the printer) to the down position. Also be sure that the face-up output tray is installed. (See Chapter 1 for details.) To select face-down printing, move the paper path selector to the up position.



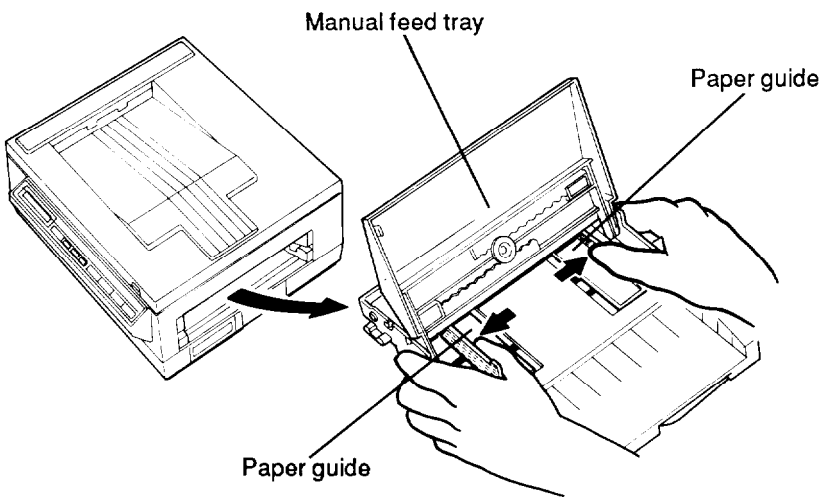
Paper Feed Methods

The paper cassette holds up to 150 sheets of 20 lb. paper for automatic printing. Additionally, the manual feed tray, on top of the paper cassette, allows you to hand-feed single sheets of paper.

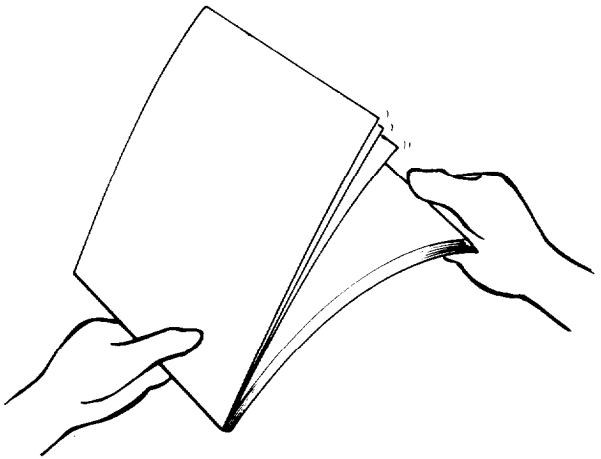
Automatic printing

To print automatically, follow the steps listed below.

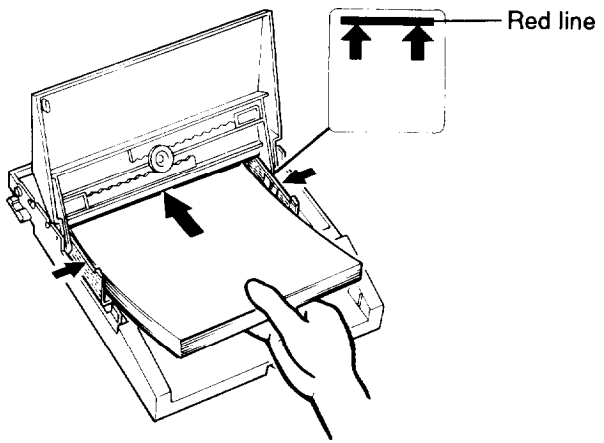
1. Remove the paper cassette.
2. Open the manual feed tray on the paper cassette. Slide the paper guides all the way apart, as shown below.



3. Take a stack of paper and fan it as shown. Next, tap the edges of the paper on a flat surface to even up the stack.

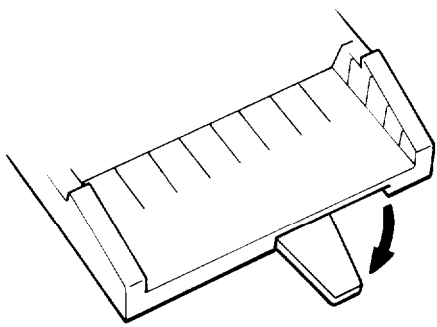


4. Insert the stack of paper into the paper cassette, making sure that the top of the stack does not cover the red line on the inside of the paper cassette. Push the paper in gently as far as it can go.



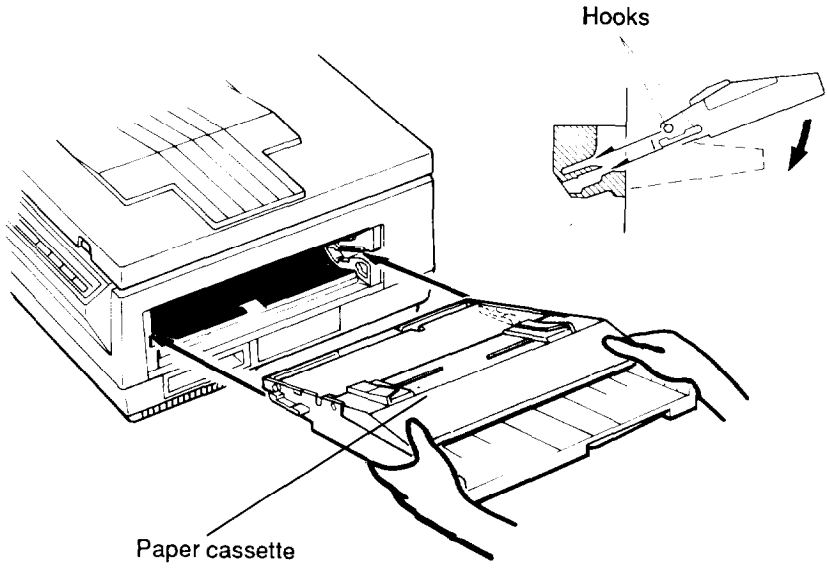
Note: Additional instructions for printing on special paper types are given below.

- To print on letterhead or three-hole punched paper, load it faceup, with the top of the paper pointing into the printer.
- To print on the back of a printed page, load the paper with the printed side face-down, top of the page in first. To reduce paper jams, manual feed is recommended for two-sided printing. (When you print on both sides of a page, the print quality on the second side may not be as good as on the first.)
- To print on legal-size paper, pull out the paper support beneath the paper cassette as shown below.



5. Slide the paper guides together (if necessary) until they are both resting lightly against the paper.
6. Close the manual feed tray.

7. Locate the paper cassette opening on the **right** side of the printer. Align the hooks on each side of **the** cassette with **the** slots **on** each side of the opening.



8. Reinsert the paper cassette into the printer with the arrow on the side of the cassette pointing into the printer. Push the cassette in until it **can** go no further and lower **the** end of the cassette (the end you load paper into) until the cassette drops into place.

CAUTION: It is particularly important to lower the cassette into place. If the cassette is not installed properly, **the message PAPER EMPTY** appears in the display.

9. For envelopes and paper weights of 27 to 34 lb. (101 to **128 g/m²),** press the **SPECIAL** button. A pound sign (#) appears at the right of the display.

10. If you want faceup delivery, set the paper path selector to the down position.

11. If the paper you have just loaded is a different size than the paper you last used, set the SelecType option for the new paper size, as described in Chapter 3.

12. Press the *ON* LINE button to set the printer on line.

Now your laser printer is ready to print.

Feeding paper manually

If you want to print on mailing labels, heavy paper (over 27 lb. or 101 g/m^2), light-weight paper (14 through 16 lb. or 52 through 60 g/m^2), envelopes, or transparencies, or if you are printing a small job on a different type of paper than is already in the cassette, you can hand-feed the paper using the manual feed tray.

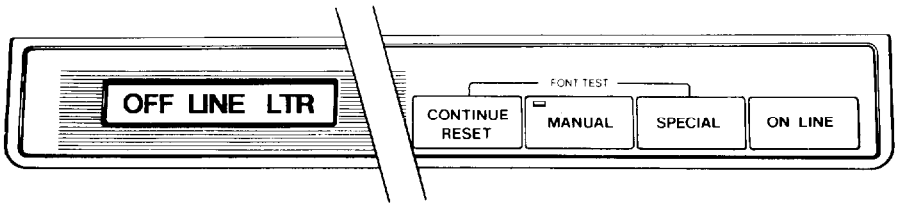
You can manually feed paper ranging in size from 3.2 x 5.0 inches (82 x 127 mm) to 8.5 x 14.0 inches (216 x 356 mm).

> Note: For best results, it may be necessary to change the amount of paper in the paper cassette; it is recommended that you leave the cassette half-filled (half-way to the red line) during manual printing.

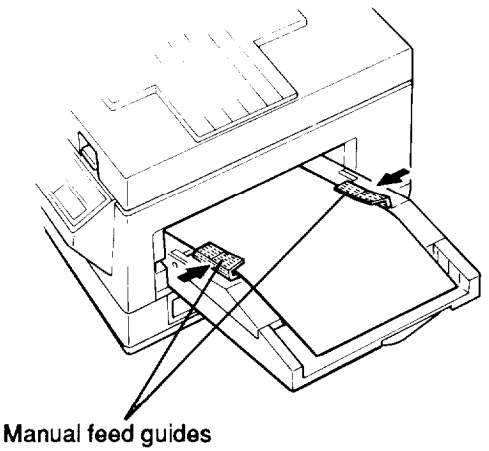
It is easy to hand-feed paper with the laser printer; just follow the steps listed below.

1. If the paper size you are printing on is different than the paper size you just used, use SelecType to select the new paper size as described in Chapter 3. (If you are using a non-standard paper size that is not listed in SelecType, skip this step.)

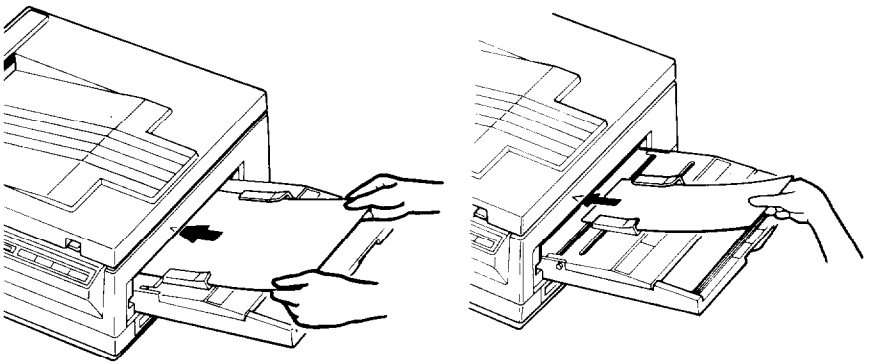
2. If the printer is on line, press the **ON LINE** button to set the printer off line. Set the printer for manual printing by pressing the **MANUAL** button on the control panel. The manual light comes on.



3. Open the manual feed guides wide enough to fit the paper being printed.



4. Insert a sheet of paper into the manual feed slot, gently pushing it in as far as it can go.



Note: Insert the paper with the side you want to print on face-up. For example, to print on the back of a printed page, load the paper with the blank side face-up.

5. Slide the manual feed guides together until they are both resting lightly against the paper.
6. For envelopes and paper weights of 27 to 34 lb. (101 to 128 g/m^2), press the SPECIAL button. A pound sign (#) appears at the right of the display when you press this button.
7. For transparencies, mailing labels, envelopes, and thick paper, set the paper path selector to the down position for face-up delivery.
8. Press the ON LINE button to set the printer on line.
9. Use your application software to print your document. The message PUSH MANUAL KEY appears in the display.
10. Push the MANUAL button again to print the first page.

11. Insert the next sheet of paper and press the **MANUAL** button again. Proceed in this manner until you have finished the print job.
12. When you have completed manual printing, set the printer off line by pressing the **ON LINE** button. Next, press the **MANUAL** button. (The manual light goes out.) Then press the **ON LINE** button to set the printer back on line.

You may now resume normal printing.

Chapter 5

Printer Modes

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Using HP emulation mode. 5-2
HP printer commands 5-8

FX Emulation 5-22
Using FX emulation mode 5-22
FX printer commands 5-25

5

HP Emulation

Your laser printer offers HP emulation which enables you to use application programs written for HP LaserJet series II printers. HP emulation is the factory setting so the printer is automatically in HP emulation mode unless you change it with SelecType.

> **Note:** Epson FX emulation is also available. The **Epson** FX emulation lets you use software written specifically for Epson FX printers. You must use SelecType to choose FX emulation if you want to use it. See page 5-22 for further information.

HP emulation lets you use commercial software designed for the HP LaserJet series II printer. Simply follow the software's instructions for printing with an HP LaserJet series II printer.

Using HP emulation mode

This section gives you information about using HP emulation. It describes the unique features of your printer's HP emulation, as well as the differences between the printer's HP emulation and printing with the HP LaserJet itself.

Unique features

Certain ActionLaser Plus printer functions give you greater versatility than you get with an **HP** LaserJet series II printer. These include the following:

- The ability to print on different sizes of paper without changing the paper cassette.
- An easy-to-use control panel.

Printer menus

Many application programs let you specify the type of printer you're using. Application programs often provide an installation or setup procedure that presents a list of printers to choose from.

To take advantage of HP emulation, simply choose a printer from the list below. They are listed in order of priority.

HP LaserJet series II
HP LaserJet Plus™
HP LaserJet™

The application program's menu may list a number of more specific choices corresponding to various HP LaserJet font cartridges. (The choices are labeled with capital letters, such as **A,** B, or C.)

Fonts and font cartridges

There are six resident fonts in your printer. These correspond to the resident fonts for the HP LaserJet series II printer. They are:

Courier	12 point	portrait
Courier	12 point	landscape
Courier bold	12 point	portrait
Courier bold	12 point	landscape
Line printer	8.5 point	portrait
Line printer	8.5 point	landscape

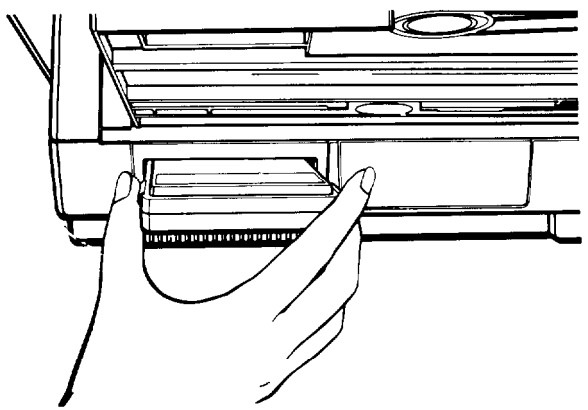
In addition, the cartridge slot on your printer lets you access a wide variety of other fonts available on font cartridges.

Installing a font **cartridge-To** install a font cartridge, follow these steps:

1. Press the **ON LINE** button to set **the** printer off line.

CAUTION: Never insert or remove the cartridge while the printer is on line.

2. Insert **the** font cartridge (with the label facing up and the connectors pointing into the printer) into **the** cartridge slot on the lower right side of the printer. Press firmly until it clicks into place.



3. Press the **ON LINE** button to set the printer on line.

Removing a font cartridge- To remove a font cartridge, follow these steps:

1. Press the **ON LINE** button to set **the** printer off line.

CAUTION: Never insert or remove the cartridge while the printer is on **line.**

2. Hold the edges of the cartridge and slowly pull it from the slot.
3. Press **the ON LINE** button to set the printer on line.

Reset

In HP emulation mode, you can reset **the** printer in the following three ways:

- By turning the power off and then back on
- **By** holding down the **CONTINUE/RESET** button for three seconds (with the printer off line)
- **By** sending the ESC **E** command.

The result varies depending upon which method you use, as **shown** in the table **on** the **next** page.

	Power Off/On	CONTINUE/RESET Button	ESC E Command
Data in Buffer	clears	clears	prints data in buffer and clears
Permanent Downloaded Fonts/Permanent Macros	clears	does not clear	does not clear
Temporary Downloaded Fonts/Temporary Macros	clears	clears	clears
SelecType Settings*	does not change	does not change	does not change

. After any reset, the printer is set to the SelecType settings, overriding any software commands that have been set.

Note: A font or macro can be designated "permanent" or "temporary" through the use of printer commands.

Paper handling

With **the** ActionLaser Plus, the paper size is not determined by **the** paper tray as it is with an HP LaserJet printer. Use the **PAPER SIZE** option in SelecType to set any of **the** four paper sizes supported by the printer. See Chapter 3 for SelecType information.

If you set the paper size with a print command that differs from the size selected in SelecType, the message **PS** CHANGE appears. Press the **CONTINUE/RESET** button to clear the error; the printer is set off line.

After clearing the error, you have two options:

1. Change **the** paper in the cassette; then enter SelecType and change the paper size to match. Press **the ON LINE** button after exiting SelecType to continue printing.
2. Alternatively, press **the ON LINE** button to continue printing on **the** current paper. (The **message PAPER** SIZE **ERR0R** appears in the display.)

For certain nonstandard sizes of paper, you may need to use **the** manual feed option described in Chapter 4.

Character clipping

If a character is partially outside the printable area, **the** HP LaserJet does not print any portion of **the** character. The ActionLaser Plus prints that portion of the character within the printable area, making it easier to tell when you have exceeded your margins.

HP printer commands

This section lists the printer commands supported in HP emulation. These commands emulate the **HP** LaserJet series II printer.

A printer command, also called an escape sequence, is a string of characters **that** is sent to the printer. The printer interprets the character string as a command to select a specific feature.

Most software packages have printer commands already embedded in them, so you may never need to use the information in this section.

An escape sequence is made up of **an** escape control code followed by one or more characters in succession.

For more information **on** printer commands, see **the** Hezdett-Packard *LaserJet series II Technical* Reference *Manual.*

Job control commands

Function	Printer Command
Control Codes	
Backspace	BS
Line Feed	LF
Form Feed	FF
Carriage Return	CR
Shift Out	SO
Shift In	SI
Escape	ESC
Bell	BEL
Horizontal Tab	HT
Space	SP
Reset	
Printer reset	ESCE
Number of copies	ESC&l#X
# = Number of copies.	
Paper input control	
Eject page	ESC&l0H
Feed from tray	ESC&l1H
Manual feed	ESC&l2H

Function	Printer Command
Page Length and Size	
Paper size	
Executive	ESC&l1A
Letter	ESC&l2A
Legal	ESC&l3A
A4	ESC&l26A
Page length	ESC&l#P
# = Number of lines.	
Orientation	
Portrait	ESC&l0O
Landscape	ESC&l1O
Margins and Text Length	
Top margin	ESC&l#E
Text length	ESC&l#F
# = Number of lines.	
Set left margin	ESC&a#L
Set right margin	ESC&a#M
# = Column number.	
Clear side margins	ESC9
Perforation Skip Mode	
Enable	ESC&l1L
Disable	ESC&l0L
Horizontal Column Spacing	
Horizontal motion index	ESC&k#H
# = Number of l/120-inch increments.	

Function	Printer Command
Vertical Line Spacing	
Vertical motion index	ESC&l#C
# = Number of 1/48-inch increments.	
Lines per inch	
1 lines per inch	ESC&l1D
2 lines per inch	ESC&l2D
3 lines per inch	ESC&l3D
4 lines per inch	ESC&l4D
6 lines per inch	ESC&l6D
8 lines per inch	ESC&l8D
12 lines per inch	ESC&l12D
16 lines per inch	ESC&l16D
24 lines per inch	ESC&l24D
48 lines per inch	ESC&l48D

Cursor positioning

Function	Printer Command
Vertical and Horizontal	
Vertical	
Vertical (lines) # = Number of rows.	ESC&a#R
Vertical (decipoints) # = Number of decipoints.	ESC&a#V
Vertical (dots) # = Number of dots.	ESC*p#Y
Horizontal	
Horizontal (columns) # = Number of columns.	ESC&a#C
Horizontal (decipoints) # = Number of decipoints.	ESC&a#H
Horizontal (dots) # = Number of dots.	ESC*p#X
Half-line feed	ESC =
End-Of-Line Termination	
Line termination	
CR=CR LF=LF FF=FF	ESC&k0G
CR=CR+LF LF=LF FF=FF	ESC&k1G
CR=CR LF=CR+LF FF=CR+FF	ESC&k2G
CR=CR+LF LF=CR+LF FF=CR+FF	ESC&k3G
Push/Pop position	
Push	ESC&f0S
Pop	ESC&f1S

Font selection

Function	Printer Command
Symbol Set Selection	
Primary symbol sets	
Line draw	ESC(0B
ISO ASCII	ESC(0U
Roman-8	ESC(8U
Roman Extension	ESC(0E
ISO Norway 1	ESC(0D
ISO United Kingdom	ESC(1E
ISO France	ESC(0F
Germany	ESC(0G
ISO Italy	ESC(0I
ISO Sweden	ESC(0S
Spain	ESC(1S
Math-7	ESC(0A
ISO JIS ASCII	ESC(0K
Math-7 2	ESC(0M
ISO Latin	ESC(0N
OCR-A	ESC(0O
ISO Norway 2	ESC(1D
ISO France 2	ESC(1F
ISO Germany 2	ESC(1G
Katakana	ESC(1K
Technical	ESC(1M
OCR-B	ESC(1O
Legal	ESC(1U
ISO China	ESC(2K
ISO Spain 2	ESC(2S
ISO IRV	ESC(2U
ISO Sweden 2	ESC(3S
ISO Portugal	ESC(4S
ISO Portugal 2	ESC(5S
ISO Spain 3	ESC(6S
OEM-1	ESC(7U

Function	Printer Command
Symbol Set Selection (continued)	
Primary symbol sets (continued)	
Greek-8	ESC(8G
Math-8	ESC(8M
PC-8	ESC(10U
PC-8 (D/N)	ESC(11U
Pi font	ESC(15U
Secondary symbol sets	
Line draw	ESC)0B
ISO ASCII	ESC)0U
Roman-8	ESC)8U
Roman Extension	ESC)0E
ISO Norway 1	ESC)0D
ISO United Kingdom	ESC)1E
ISO France	ESC)0F
Germany	ESC)0G
ISO Italy	ESC)0I
ISO Sweden	ESC)0S
Spain	ESC)1S
Math-7	ESC)0A
ISO JIS ASCII	ESC)0K
Math-7 2	ESC)0M
ISO Latin	ESC)0N
OCR-A	ESC)0O
ISO Norway 2	ESC)1D
ISO France 2	ESC)1F
ISO Germany 2	ESC)1G
Katakana	ESC)1K
Technical	ESC)1M
OCR-B	ESC)1O
Legal	ESC)1U
ISO China	ESC)2K
ISO Spain 2	ESC)2S
ISO IRV	ESC)2U

Function	Printer Command
Symbol Set Selection (continued)	
Secondary symbol sets (continued)	
ISO Sweden 2	ESC)3S
ISO Portugal	ESC)4S
ISO Portugal 2	ESC)5S
ISO Spain 3	ESC)6S
OEM-1	ESC)7U
Greek-8	ESC)8G
Math-8	ESC)8M
PC-8	ESC)10U
PC-8 (D/N)	ESC)11U
Pi Font	ESC)15U
Spacing	
Primary spacing	
Proportional	ESC(s1P
Fixed	ESC(s0P
Secondary spacing	
Proportional	ESC)s1P
Fixed	ESC)s0P
Pitch	
Primary pitch	
10 CPI	ESC(s10H
12 CPI	ESC(s12H
16.66 CPI	ESC(s16.6H
Secondary pitch	
10 CPI	ESC)s10H
12 CPI	ESC)s12H
16.66 CPI	ESC)s16.6H

Function	Printer Command
Point Size	
Primary point size	
7 Pt.	ESC(s7V
8 Pt.	ESC(s8V
8.5 Pt.	ESC(s8.5V
10 Pt.	ESC(s10V
12 Pt.	ESC(s12V
14.4 Pt.	ESC(s14.4V
Secondary point size	
7 Pt.	ESC)s7V
8 Pt.	ESC)s8V
8.5 Pt.	ESC)s8.5V
10 Pt.	ESC)s10V
12 Pt.	ESC)s12V
14.4 Pt.	ESC)s14.4V
Style	
Primary style	
Upright	ESC(s0S
Italic	ESC(s1S
Secondary style	
Upright	ESC)s0S
Italic	ESC)s1S

Function	Printer Command
Stroke Weight	
Primary stroke weight	
Light (-3)	ESC(s-3B
Medium (0)	ESC(s0B
Bold (3)	ESC(s3B
Secondary stroke weight	
Light (-3)	ESC)s-3B
Medium (0)	ESC)s0B
Bold (3)	ESC)s3B
Typeface	
Primary typeface	
Line printer	ESC(s0T
Courier	ESC(s3T
Helvetica	ESC(s4T
Tms Rmn	ESC(s5T
Gothic	ESC(s6T
Prestige Elite	ESC(s8T
Secondary typeface	
Line printer	ESC)s0T
Courier	ESC)s3T
Helvetica	ESC)s4T
Tms Rmn	ESC)s5T
Gothic	ESC)s6T
Prestige Elite	ESC)s8T
Font Pitch	
Font pitch (alternate method)	
Standard pitch	ESC&k0S
Compressed pitch	ESC&k2S

Function	Printer Command
Underline	
Enable fixed underlining	ESC&d0D
Enable floating underlining	ESC&d3D
Disable underlining	ESC&d@

Font management

Function	Printer Command
Font Management	
Specify font ID	ESC*c#D
# = Font ID number.	
Font and character control	
Delete all fonts	ESC*c0F
Delete all temporary fonts	ESC*c1F
Delete last specified font ID	ESC*c2F
Make temporary font	ESC*c4F
Make permanent font	ESC*c5F
Font Selection by ID Number	
Primary	ESC(#X
Secondary	ESC)#X
# = Font ID number.	

Soft font creation

Function	Printer Command
Soft Font Creation	
Create font (font header)	ESC)s#W [data]
# = Number of bytes.	
Download character	ESC(s#W [data]
# = Number of bytes.	
Specify character code	ESC*c#E
# = ASCII code number (decimal).	

Graphics

Function	Printer Command
Raster Graphics	
Resolution	
75 dots per inch	ESC*t75R
100 dots per inch	ESC*t100R
150 dots per inch	ESC*t150R
300 dots per inch	ESC*t300R
Start graphics	
Left-most position	ESC*r0A
Current cursor	ESC*r1A
Transfer	ESC*B#W [data]
# = Number of rows.	
End graphics	ESC*rB

Function	Printer Command
Rectangle Dimensions	
Horizontal size (width) # = Number of dots.	ESC*c#A
Horizontal size (width) # = Number of decipoints.	ESC*c#H
Vertical size (height) # = Number of dots.	ESC*c#B
Vertical size (height) # = Number of decipoints.	ESC*c#V
Rectangular Area Fill	
Fill rectangle area	
Rule	ESC*c0P
Gray scale	ESC*c2P
HP pattern	ESC*c3P
Gray scale pattern ID	
2% gray	ESC*c2G
10% gray	ESC*c10G
15% gray	ESC*c15G
30% gray	ESC*c30G
45% gray	ESC*c45G
70% gray	ESC*c70G
90% gray	ESC*c90G
100% gray	ESC*c100G
Pattern ID	
1 Horizontal lines	ESC*c1G
2 Vertical lines	ESC*c2G
3 Diagonal lines	ESC*c3G
4 Diagonal lines	ESC*c4G
5 Square Grid	ESC*c5G
6 Diagonal grid	ESC*c6G

Macros

Function	Printer Command
Macro ID and Control	
Macro ID	ESC&f#Y
# = Macro ID number.	
Macro control	
Start macro	ESC&f0X
Stop macro	ESC&f1X
Execute macro	ESC&f2X
Call macro	ESC&f3X
Enable overlay	ESC&f4X
Disable overlay	ESC&f5X
Delete macros	ESC&f6X
Delete all temporary macros	ESC&f7X
Delete macro ID	ESC&f8X
Make temporary	ESC&f9X
Make permanent	ESC&f10X

Programming aids

Function	Printer Command
Miscellaneous Features	
Enable display functions mode	ESCY
Disable display functions mode	ESCZ
Transparent print data	ESC&p#X [data]
# = Number of bytes.	
Self test	ESCz
End of Line Wrap	
Enable line wrap	ESC&s0C
Disable line wrap	ESC&s1C

FX Emulation

Your laser printer offers FX emulation which enables you to use application programs written for FX printers. To use FX emulation, you must use SelecType to choose it; see Chapter 3 for details.

FX emulation lets you use commercial software designed for FX printers. Simply follow the software's instructions for printing with an FX printer.

Using FX emulation mode

This section gives you information about using FX emulation. It describes the unique features of your printer's FX emulation, as well as the differences between your printer's FX emulation and printing with the FX printer itself.

Printer menus

Many application programs let you specify the type of printer you're using by selecting a printer from **a** menu.

To take advantage of FX emulation, simply choose a printer from the list below. They are listed in order of preference.

FX-850
FX-86e
FX-85
FX-80+
FX-80
MX-80
Epson printer

Paper handling and application software setup

Epson FX printers are designed to print on continuous forms and cut sheet paper. Your printer cannot print on continuous forms, but with an FX emulation selected, your ActionLaser Plus is similar to an FX printer with an optional cut sheet feeder.

Your application software may have to be set up for this difference. Select an Epson FX printer driver and use your software's Cut Sheet Feeder selection, if available. If such a selection is not available, set up your software to send a Form Feed command at the end of each page. This is important because the ActionLaser Plus requires a Form Feed command before it prints a page.

It is also important to be sure the number of printable lines per page your application software is sending matches the number of printable lines per page available on your printer. The number of printable lines per page for your printer can be found by performing a status print test from the control panel and checking Text Length. The recommended length for letter size paper is 62 lines per page, with Skip-Over Perforation set to ON using SelecType. You may also need to adjust the Top of Form (top margin) setting for your printer or your application software, since a top margin is automatically added to your printed output.

> Note: To perform the status print test, set your printer off line, then press the ▲ and ▼ buttons on the control panel at the same time. When you release the buttons, STATUS PRINT appears on the display and the printer outputs the status print test.

Memory requirements

If you print standard text, such as with a typical word processing program, you should have no problems with memory. If you use graphic applications, however, you may need to add an optional memory board to your printer.

Font selection

Most newer Epson FX printers have a selection of Roman and Sans Serif fonts available. Your FX emulation features the Courier font only. (A smaller, Line Printer font is automatically selected when you choose Condensed printing.) Other font selections from font cartridges or downloaded soft fonts **are** not available.

12 cpi printing

When 12 character per inch (cpi) printing is selected, the Epson FX emulation uses the 10 cpi Courier typeface and adjusts the intercharacter spacing to create 12 cpi printing.

Initialization command

Because the printer processes a full page of data at once, the initialization command (ESC @) prints any data in the buffer and ejects the page. If your software program uses ESC @ in the middle of the page, the page ejects and the rest of the data prints on the next page. For this reason, ESC @ should only be used at the beginning or end of a page.

SelecType orientation selection

The FX emulation lets you select portrait (vertical) or landscape (horizontal) orientation from SelecType. Most software expects portrait orientation, so be sure your software's margin settings are set appropriately if you select landscape orientation with SelecType. Landscape orientation also may require more memory than portrait orientation. An optional memory board is available if more memory is required.

Unsupported commands

There are several Epson FX printer commands that are not applicable to this printer technology and are not supported. The functions that are not supported include Near Letter Quality selection, paper-out sensor control, user-defined character commands, and automatic justification. **A** complete list of unsupported commands is given in the next section.

FX printer commands

This section lists the printer commands supported in FX emulation mode. (Most software packages have printer commands already embedded in them, so you may never need to use the information in this chapter.)

A printer command, also called an escape sequence, is a string of characters that is sent to the printer. The printer interprets the character string as a command to select a specific feature.

If a command has no parameters, it is merely listed. If it has parameters, they are explained. The parameters are indicated by lowercase italicized letters, usually n. The examples below show how the parameters are indicated.

ESC @ is a command with no parameters.

ESC p 1/0 is a command that uses 1 to turn the feature on and 0 to turn it off.

ESC $ n1 n2 is a command with two parameters.

ESC D nn is a command with a variable number of parameters.

> **Note:** Except where noted, the values given for parameters are in decimal.
>
> Also, the ASCII character ESC is used in most commands. The decimal value for ESC is 27, and the hexadecimal value is 1B. These values are not repeated below.

Command summary

ASCII	Dec.	Hex.	Description
Initialize			
ESC @	64	40	Initialize printer
Page Format			
ESC C 0 n	67	43	Set page length in inches n = no. of inches (1-22)
ESC C n	67	43	Set page length in lines n = no. of lines (1-127)
ESC N n	78	4E	Set skip over perforation n = no. of lines (1-127)
ESC O	79	4F	Cancel skip over perforation
Margin Set			
ESC l n	108	6C	Set left margin n = left margin column
ESC Q n	81	51	**Set** right margin n = right margin column
Line Spacing			
ESC 0	48	30	Select 1/8-inch line spacing
ESC 1	49	31	Select 7/72-inch line spacing
ESC 2	50	32	Select 1/6-inch line spacing
ESC 3 n	51	33	Select n/216-inch line spacing *(0 < n < 255)*
ESC A n	65	41	Select n/72-inch line spacing *(0< n < 85)*

ASCII	Dec.	Hex.	Description
Tab Setting			
ESC D nn	68	44	Set horizontal tabs Up to 32 tabs (1-255) entered in ascending order; last *n* should be 0
HT	9	09	Tab horizontally
ESC B *nn*	*66*	*42*	Set vertical tabs Up to 16 tabs (1-255) entered in ascending order; last n should be 0
VT	11	0B	Tab vertically
ESC b nn	98	62	Set vertical tabs in channels Same as ESC B except the first *n* selects a channel (0-7) for tabs
ESC / n	47	2F	Select vertical tab channel *n* = vertical tab channel (0-7). If no channel has been selected, channel 0 is used
Pitch/Proportional			
ESC P	80	50	Select 10 cpi
ESC M	77	4D	Select 12 cpi
ESC p l/0	112	70	Turn proportional mode on/off
ESC SP *n*	*32*	*20*	Set intercharacter space *n* = units of space (0 - 127) in 1/120 inch increments

ASCII	Dec.	Hex.	Description
Enhancements			
SI	15	0F	Select condensed mode
ESC SI	15	0F	Select condensed mode
DC2	18	12	Cancel condensed mode
SO	14	0E	Select double-wide mode (one line)
ESC SO	14	0E	Select double-wide mode (one line)
DC4	20	14	Cancel one-line double-wide mode
ESC W1/0	87	57	Turn double-wide mode on/off
ESC w1/0	119	77	Turn double-high mode on/off
ESC E	69	45	Select emphasized mode
ESC F	70	46	Cancel emphasized mode
ESC G	71	47	Select double-strike mode
ESC H	72	48	Cancel double-strike mode
ESC - 1/0	45	2D	Turn underlining mode on/off
ESC S 0 1	83	53	Select superscript mode
ESC S	83	53	Select subscript mode
ESC T	84	54	Cancel super/subscript mode
ESC 4	52	34	Select italic mode
ESC 5	53	35	Cancel italic mode
ESC ! n	33	21	Master select To find the value of *n* add together the numbers of the typestyles you want to combine: 0 cpi: 0 decimal, 00 hex; 12 cpi: 1, 01; proportional: 2, 02; condensed: 4, 04; emphasized: 8, 08; double-strike: 16, 10; double-wide: 32, 20; italic: 64, 40; underline: 128, 80

ASCII	Dec.	Hex.	Description

Graphics

ESC *m *n1 n2 42* **2A** **Select** graphics mode
Selects **graphics mode m**
The total number of columns = n1 + (n2 x 256). This command is followed by d1 . . . dn data numbers.

Option	Alternate code	*m*
Single-density	ESC K	0
Double-density	ESC L	1
High-speed double-density	ESC Y	2
Quadruple density	ESC Z	3
CRT I	none	4
Plotter (1:1)	none	5
CRT II	none	6

ESC K n1 *n2 75* 4B Select single-density graphics mode*

ESC L *n1 n2 76* *4C* Select double-density graphics mode*

ESC Y n1 *n2 89* *59* Select high-speed double-density graphics mode*

ESC Z *n1 n2 90* **5A** Select quadruple-density graphics mode*

* Note: The total number of columns = n1 + (n2 x 256). Each of these commands is followed by *d1 . . . dn* data numbers.

ESC [A] m n1 *n2 94* 5E Select 9-pin graphics mode
m = print density (0 for single; 1 for double). The total number of columns = *n1 + (n2* x 256). This command is followed by d1 . . . *dn* data numbers.

ESC ? s m 63 3F Reassign graphics mode
Reassigns command s (K, L, Y, or Z), to mode m (0-6). See ESC *.

ASCII	Dec.	Hex.	Description
Printer Control			
CR	13	0D	Carriage return
LF	10	0A	Line feed
FF	12	0C	Form feed
ESC J n	74	4A	**Perform** n/216-inch line feed *(0 < n < 255)*
Character Sets			
ESC t n	116	74	Select character table n = 0 (italic) *n* = 1 (Epson Extended Graphics)
ESC 6	54	36	Enable printable characters Enables the printing of codes 128 - 159 (decimal) as characters
ESC 7	55	37	Enable upper control codes Cancels ESC 6
ESC I 1/0			Printable code area expansion on/off Enables the printing of codes 0 - 31 and 128 - 159 (decimal) as characters
ESC R n	82	52	Select international character set Values for *n* are: 0=USA, 1=France, 2=Germany, 3=UK, 4=Denmark I, 5=Sweden, 6=Italy, 7=Spain I, 8=Japan, 9=Norway, 10=Denmark II, 11=Spain II, 12=Latin America

ASCII	Dec.	Hex.	Description
Other Codes			
CAN	24	18	Cancel line
DEL	127	7F	Delete character
ESC $ n1 n2	36	24	Set absolute print position Specifies print position from left margin in 1/60 inch units. Total units = n1 + (n2 x 256)
ESC \ *n1 n2*	*92*	5C	Set relative print position Moves current print position in 1/120 inch units. Total units = *n1 + (n2 x 256)*
BEL	7	07	Beeper
BS	8	08	Backspace
ESC >	62	3E	Set MSB bit of incoming data to 1
ESC #	35	23	Cancel MSB control
ESC=	61	3D	Set MSB bit of incoming data to 0
DC1	17	11	Select printer
DC3	19	13	Deselect printer

Unsupported commands

The following commands are not supported in FX emulation. **If** sent to the printer, they are ignored.

Command	ASCII
Cut sheet feeder operation	ESC EM
Select user-defined set	ESC %
Define user-defined characters	ESC &
Disable paper-out sensor	ESC 8
Enable paper-out sensor	ESC 9
Copy ROM into RAM	ESC :
Select justification	ESC a
Select immediate print mode	ESC i
Reverse paper feed	ESC j
Select NLQ font	ESC k
Select half-speed mode	ESC s
Select Near Letter Quality	ESC x
Unidirectional mode (1 line)	ESC <
Turn unidirectional on/off	ESC U

Chapter 6

Maintenance and Transportation

6

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Maintenance

Component	Life cycle (in pages)
Toner cartridge	1,500 pages
Cleaning pad	1,500 pages
Drum unit	10,000 pages*
Service overhaul	100,000 pages

'If you regularly print high density graphics (more than 20% page density), you need to replace the drum unit more often.

The toner cartridge and cleaning pad must be replaced about every 1,500 pages. (The initial toner cartridge lasts about 750 pages.) A TONER EMPTY message appears when it is time to change these components.

The drum unit must be replaced about every 10,000 pages. (If you regularly print high density graphics (more than 20% page density), you need to replace the drum unit at the same time you install the eighth toner cartridge.) When you replace the drum unit, it is also necessary to change the drum replacement cartridge, which monitors drum usage.

A CHANGE DRUM message appears when it is time to change the drum unit and drum replacement cartridge. Also, the indicator light on the drum replacement cartridge helps you monitor drum usage, so that you know **when** a drum change is imminent.

A service overhaul must be performed at 100,000 pages by an Epson Customer Care Center. Call 1-800-922-8911 for a referral.

Each of these procedures is described in detail in **this** chapter.

Maintenance Messages

The printer's display lets you know when you need to perform routine maintenance procedures. The toner cartridge and drum unit must be replaced on a regular basis. The messages described below tell you when to perform these tasks.

It is recommended that you keep in stock at least one drum unit and several replacement toner cartridges. See Appendix B for storage information.

Toner empty message

The initial toner cartridge, which is shipped with your printer, lasts about 750 pages. Replacement toner cartridges last about 1,500 pages. These page amounts are based on letter or A4-size pages with normal text printing (5 percent print density). If you print higher density graphics or use larger paper, the number of pages per cartridge may decrease. The number of pages can also vary if you change the print density control setting (described in Chapter 2).

The TONER EMPTY message indicates that you need to do the following:

- Replace the toner cartridge
- Replace the cleaning pad, which is packed with your replacement toner cartridge
- Perform certain routine cleaning procedures, which take only a few moments. (Since cleaning your printer requires you to turn off the power, you may want to finish your print job before cleaning the printer.)

Changing the toner cartridge and cleaning pad

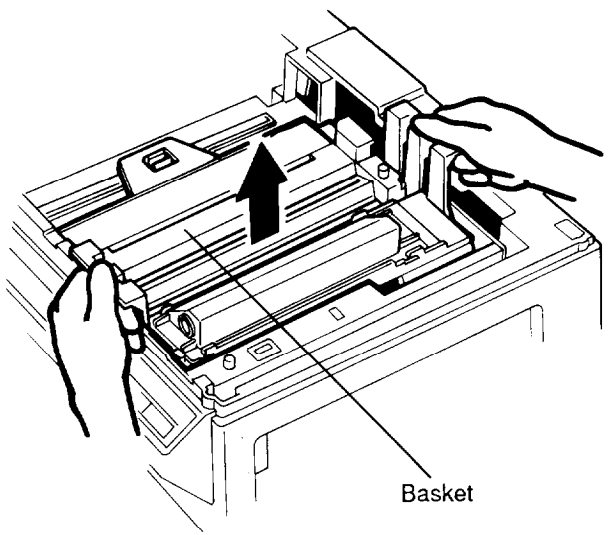
Replace the toner cartridge and cleaning pad as follows.

1. Prepare a clean flat surface to set the basket on. To catch excess toner that may remain in the used toner cartridge, it is recommended that you spread some paper on the surface.
2. Raise the top cover of your printer by lifting up on the latch.

WARNINGS:

- Opening the printer exposes the fusing unit, the orange area marked with a caution label. This unit is very hot, so be careful not to touch it.
- This procedure exposes the green drum. Because the drum is light-sensitive, it should not be exposed to room light for any longer than necessary (a few minutes at most). Thus, it is recommended that you cover the drum unit with a soft cloth or sheet of paper whenever the drum is exposed.

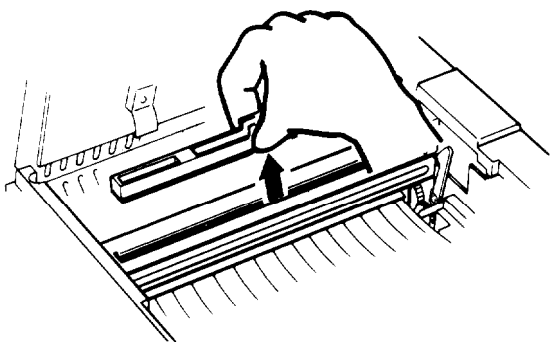
3. Remove the basket from the printer and place it on the paper.



4. Locate the cleaning pad inside your printer. The cleaning pad is the long black pad with green felt handles located in **a** slot on the orange-colored fuser.

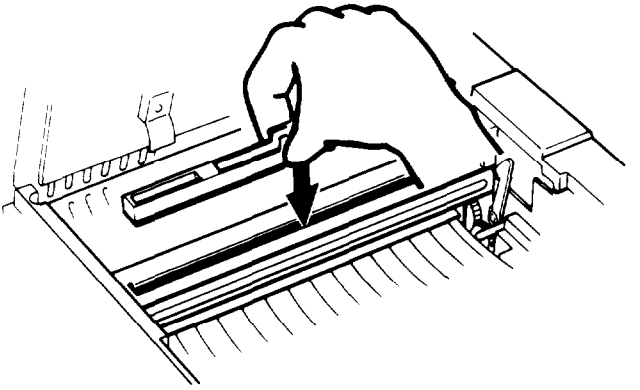
WARNING: The fuser and the cleaning pad are very hot. Be careful to touch only the green felt handles on the pad when you remove it. Do not touch the fuser or the pad itself.

5. Carefully take hold of the green felt handles and lift out the used cleaning pad. (Be careful not to let dirt from the pad drop into the printer.) Discard the cleaning pad.



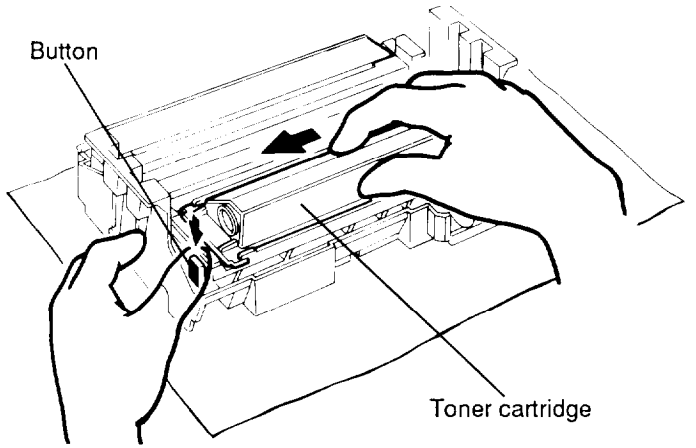
6. Locate the new cleaning pad, which was packed with your replacement toner cartridge.

7. Holding the green felt tabs on the new cleaning pad, insert the pad into the indentation on the fuser.

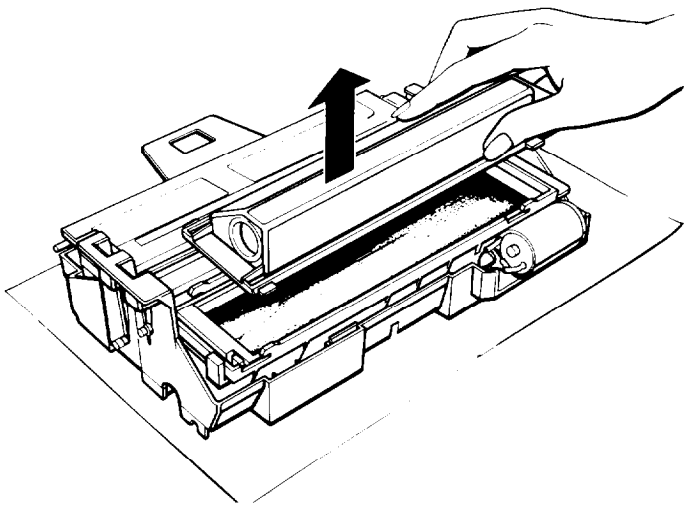


8. Now locate the toner cartridge, which is in the basket you removed earlier. Tap lightly on the used cartridge so that remaining toner drops into the developer unit.

9. Hold down the green button holding the toner cartridge in place on the developer unit. As you hold down the button, slide the toner cartridge toward the button to disengage it from the developer unit, as shown below.

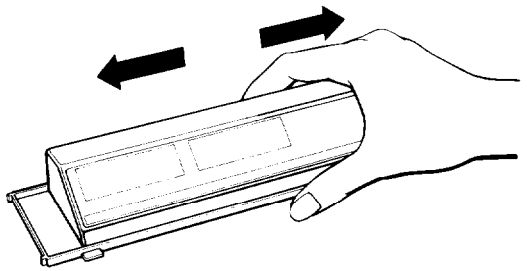


10. Lift off the cartridge and discard it. Avoid touching the bottom of the cartridge.

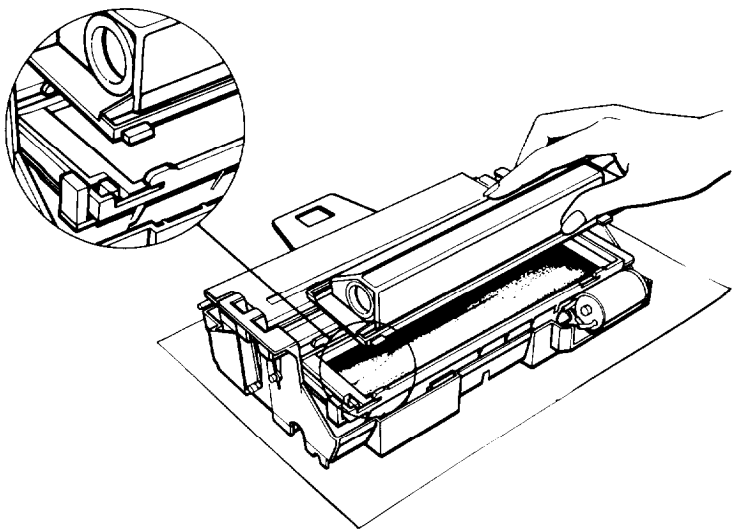


> **Note:** Be careful not to get any dust or dirt into the exposed developer unit.

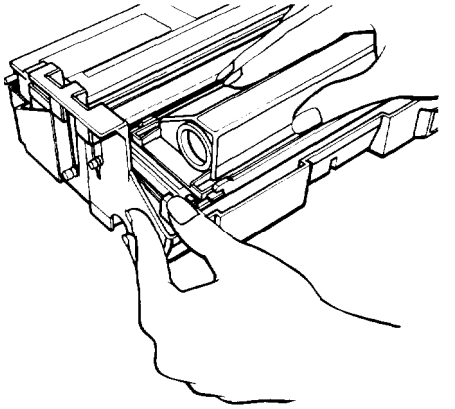
11. Holding the new replacement toner cartridge horizontally, gently shake it back and forth a few times to distribute the toner.



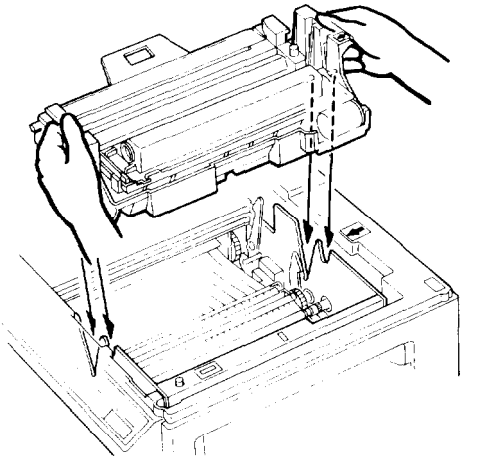
12. Hold the toner cartridge over the developer unit so that the label is facing up, with the top of the label pointed toward the inside of the basket. Align the four hooks on the cartridge with the slots in the developer unit and set the cartridge onto the developer unit.



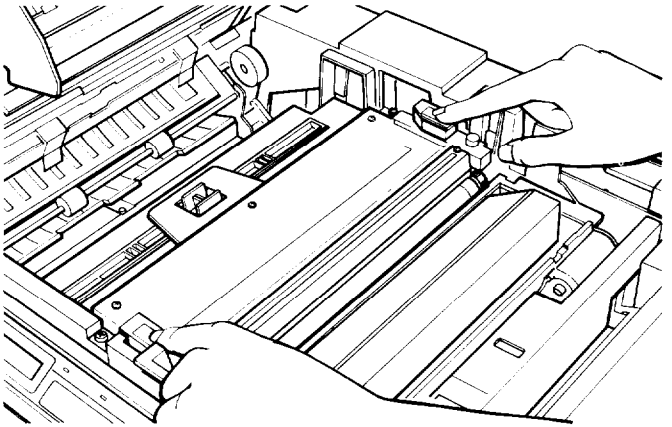
13. Hold down the green button. Pressing down on the toner cartridge, firmly slide the hooks on the cartridge into the slots on the developer unit. Then release the button to lock the cartridge into place. (You should see a second green button pop up to lock in the cartridge.)



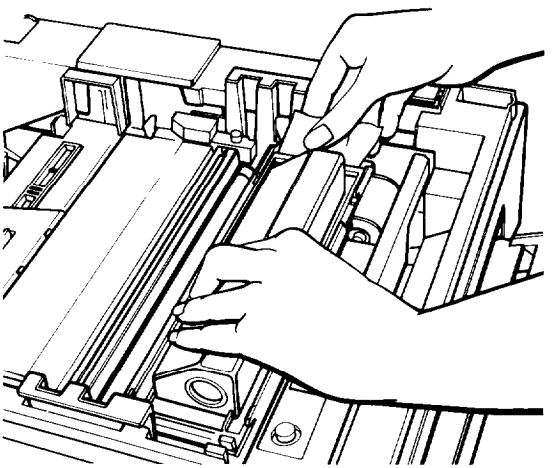
14. Now reinstall the basket. With the top cover of the printer open, align the arrow on the back of the basket with the arrow on the printer case. (The arrows point toward each other when **the** unit is properly installed.) Gently lower the basket into place.



15. Press down simultaneously on the drum unit's two green handles until the drum unit clicks into place.

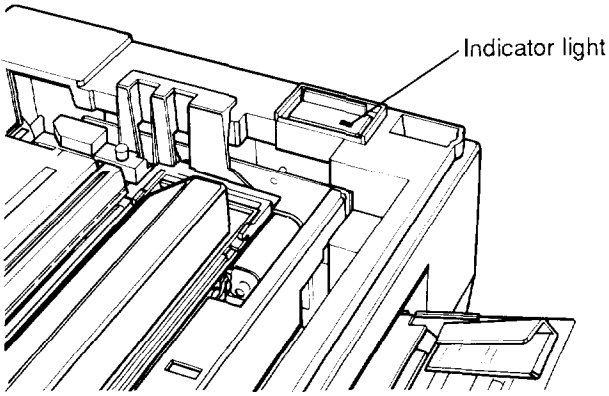


16. Unfasten the tape holding the clear plastic film in place on the replacement toner cartridge.
17. Pressing down on the toner cartridge to hold it firmly in place, pull the film up and out toward the back of the printer. Pull firmly until the other end of the film comes out of the cartridge.



CAUTION: Once the toner cartridge has been installed, do not remove you are prompted to do so by the control panel. Otherwise, toner can spill into the printer. See the transportation section in this chapter if you need to ship the printer when it has toner in it.

18. Check the indicator light on the drum replacement cartridge. (You should do this each time you change the toner cartridge.)



This indicator helps you monitor usage of the drum, which must be replaced every 10,000 pages:

- Green light (0 - 7,500 sheets): The drum unit can print at least 2,500 pages more and does not need to be replaced.
- Orange light (7,501 - 9,900 sheets): Make sure you have a drum unit in stock. You have fewer than 2,500 pages to print before the **CHANGE DRUM** message appears.
- Red light (9,901 - 10,000 sheets): You have fewer than 100 pages to print before the CHANGE DRUM message appears. You may wish to replace **the** drum unit as soon as you see **this** red light. If you wait until CHANGE DRUM appears, you need to follow a special procedure (described in the section on changing the drum) to complete your print job.

CAUTION: **If you** regularly print high density (more than 20 percent page density) graphics, you need to replace the drum unit more frequently. You must keep track of the number of toner cartridges you have used, and replace the drum unit and drum replacement cartridge at the same time you install the eighth toner cartridge. Do not wait for the CHANGE DRUM message to appear on the control panel. Overuse of the drum unit results in a reduction of print quality and increased maintenance requirements.

19. There are certain printer components inside the printer you must clean each time you replace the toner cartridge. See the Routine Printer Cleaning section on page 6-19. (You need to locate some isopropyl alcohol for cleaning purposes before cleaning the printer.)

Note: Because it is necessary to turn off your printer before cleaning it, you may want to finish your print job as soon as you replace the toner cartridge and cleaning pad. If so, simply close the printer cover and press the **ON LINE** button. Be sure to clean your printer as soon as you have finished printing.

Change drum message

The CHANGE DRUM message indicates that you need to do the following:

- Replace the drum unit
- Replace the drum replacement cartridge
- Perform routine cleaning procedures, which take only a few moments.

The drum unit and drum replacement cartridge must be replaced every 10,000 pages. It is necessary to turn off the printer to replace the drum unit and drum replacement cartridge. However, you can finish your print job first by following the procedure described below.

Completing your print job before changing the drum

After the CHANGE DRUM message appears, you can print up to 100 pages more before changing the drum, as follows:

1. Print 10 pages at a time by pressing the **ON LINE** button. You can do this up to nine times for a total of 90 pages.
2. You can then print one page at a time by pressing the **ON LINE** button. You can do this for 10 more pages. Then you must change the drum unit.

Monitoring drum usage

You should check the indicator light on **the** drum replacement cartridge **each** time you change the toner cartridge. This indicator helps you monitor drum usage, as described on page 6-1 1. The indicator light lets you know in advance of the display panel when the drum unit should be changed.

CAUTION: If you regularly print high density graphics (more than 20 percent page density), you need to replace the drum unit more frequently. You must keep track of the number of toner cartridges you have used, and replace **the** drum unit and drum replacement cartridge at the same time you install the eighth toner cartridge. Do not wait for the **CHANGE DRUM message to** appear on the control panel. Overuse of the drum unit results in a reduction of print quality and increased maintenance requirements.

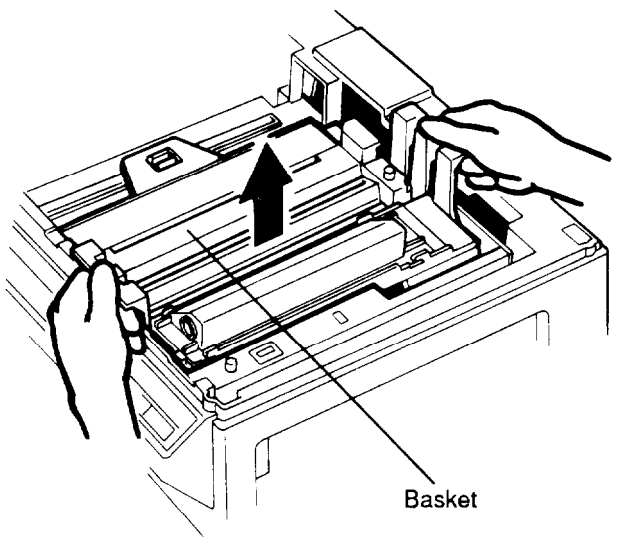
Changing the drum unit and drum replacement cartridge

Note: Before changing the drum, you should locate some alcohol to use for cleaning purposes.

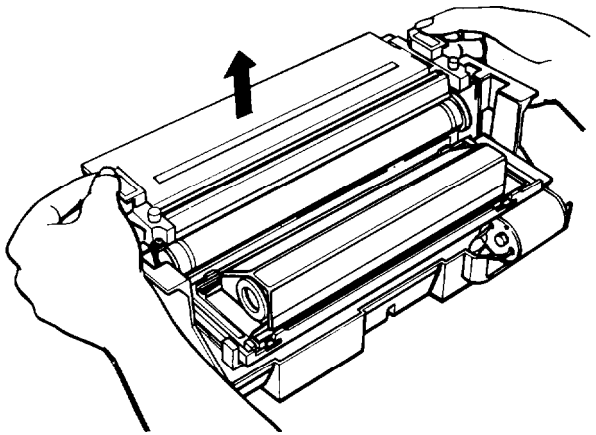
1. Turn off your printer. (To finish your print job first, see the instructions above on completing your print job before changing the drum.)
2. Raise the top cover of your printer by lifting up on the latch.

WARNING: Opening **the** printer exposes the fusing unit, the orange area marked with a caution label. This unit is very hot, so be careful not to touch it.

3. Remove the basket and place it on a flat surface.



4. Remove the drum unit **from the** basket by lifting up on **the** green handles. Discard the drum unit.



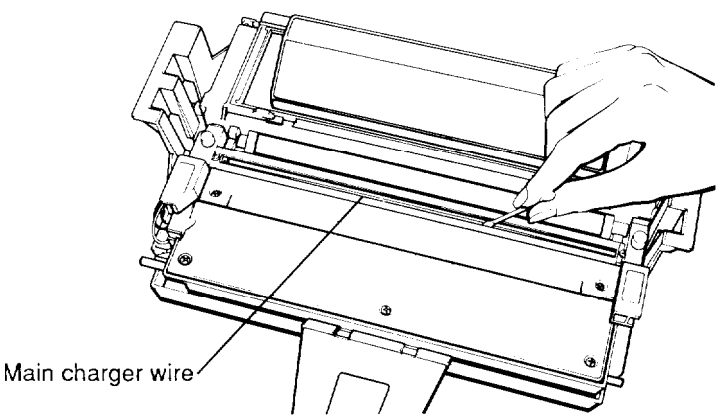
5. Unpack the new drum and the cotton swab (packed with the drum). Insert the drum in **the** basket.

CAUTIONS:

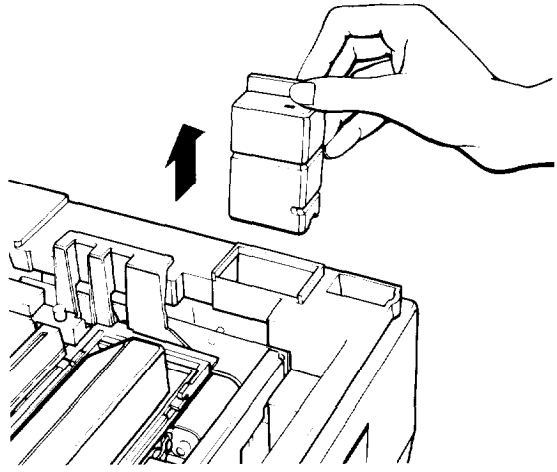
- Do not touch **the** surface of **the** green drum.
- The drum is light-sensitive and should not be exposed to room light for any longer than necessary (a few minutes at most). It is recommended **that you** cover **the** drum unit with a soft **cloth** or **sheet** of paper whenever the drum is exposed.

6. Locate the main charger wire, which extends along the length of the green drum inside a slot directly over the drum. Gently clean the main charger wire with the cotton swab by running the swab along the length of the wire. You need to insert the cotton swab a fraction of an inch into the slot to reach the wire.

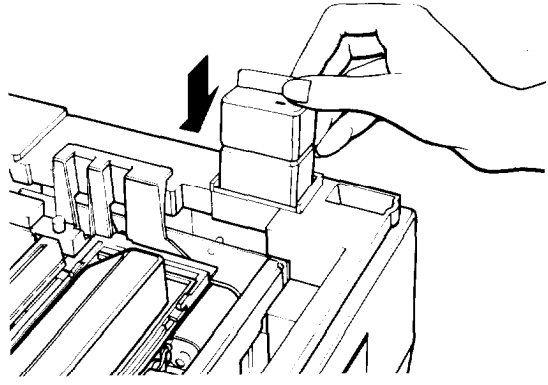
> Note: The charger wire is thin and silver, so it is difficult to see.



7. Now change the drum replacement cartridge. Locate the used drum replacement cartridge, which is in the right rear comer of the printer frame (with the printer cover open). Then pull out the used cartridge from the slot and discard it.



8. Insert the new drum replacement cartridge, which was packed with your drum unit, with the indicator light facing the front of the printer. Press down on the cartridge until it is inserted all the way.



9. Store the developer cleaner, which was also packed with the drum, in a safe place for future use. You need to use the developer cleaner to clean the developer unit if vertical white lines appear on your printed page. (The General Printer Maintenance section of this chapter has details.)

Before reinstalling the basket with the new drum unit in your printer, be sure to perform the cleaning procedures described below.

Routine cleaning

There are certain printer components inside the printer you must clean each time you replace the drum unit. See the following section on printer cleaning.

Routine Printer Cleaning

It is necessary to clean certain printer components regularly to ensure optimal print quality. Cleaning should be performed whenever the drum unit or toner cartridge is replaced. You should also clean the components listed below if you are having problems with print quality, as discussed in Chapter 7.

Cleaning schedule

The toner cartridge is replaced about every 1,500 pages, and the drum unit is replaced every 10,000 pages. Each time you replace one of these components, you should clean the following items:

- Transfer charger wire and discharge wire
- Paper guide
- Basket
- Laser beam lens.

Note: You should also clean each of these items if you are having print quality problems, as discussed in Chapter 7.

(When replacing the drum, you should also clean the main charger wire on the new drum unit, as described in the section on replacing the drum unit.)

WARNING: You should turn off your printer and disconnect the power cord before cleaning your printer.

Cleaning the transfer charger and discharge wires

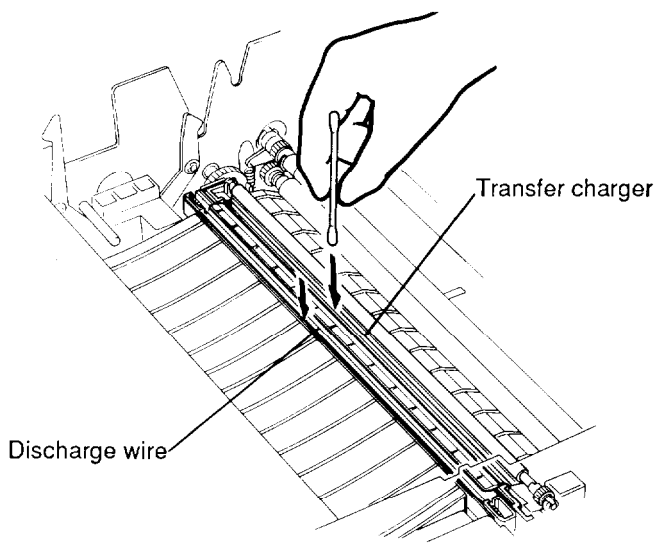
Follow the steps below to clean the transfer charger wire and discharge wire.

Note: Locate some isopropyl alcohol to use for cleaning purposes before proceeding.

1. Make sure the printer is turned off; then disconnect the power cord from the wall outlet. Also be sure that the printer cover is open and that the basket is removed from the printer.

CAUTION This procedure exposes the green drum unit, which is in the basket. Because the drum is light-sensitive, it should not be exposed to room light for any longer than necessary (a few minutes at most). Thus, it is recommended that you cover the drum unit with a soft cloth or sheet of paper whenever the drum is exposed.

2. Locate a cotton swab.
3. With the printer cover open, locate the transfer charger wire and the discharge wire, which are in indentations at the bottom of the printer, beneath where the basket normally rests. These wires are thin and difficult to see.



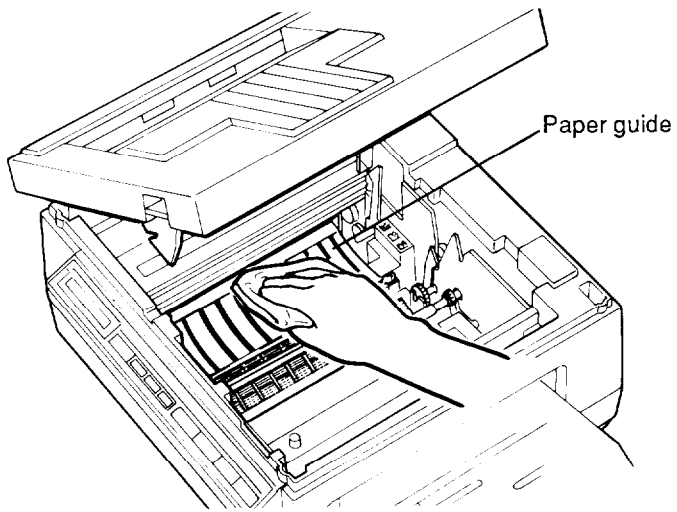
CAUTION: When cleaning the wires, be careful not to press too hard. The wires are delicate and can break if you apply too much pressure. Also, never touch the wires with your fingers.

4. Gently clean each wire with the cotton swab dipped in alcohol by rubbing the swab along the length of the wire. You need to insert the cotton swab a fraction of an inch into each slot to reach the wires.
5. Proceed to the next section on cleaning the paper guide and basket.

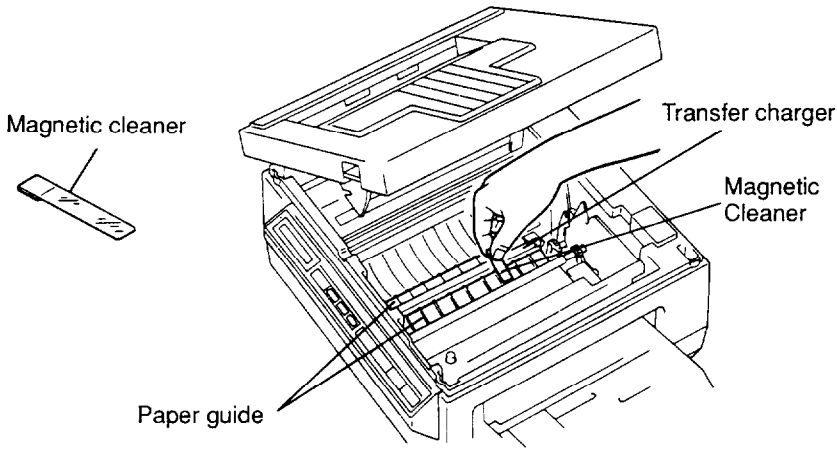
Cleaning the paper guide and basket

1. Clean the paper guide inside the printer with a clean, dry cloth as shown in the illustration below.

Note: Do not use alcohol to clean the paper guide or the basket.



2. If toner has accumulated on the black portion of the paper guide near the transfer charger, remove the toner by carefully drawing the magnetic cleaner across the paper guide. (This cleaner was included in the accessory pack shipped with your printer.)



3. Now use the cloth to clean the bottom of the basket. (It is recommended that you first remove the drum unit and developer unit from the basket, setting them on a flat, clean surface.) Be sure to clean the flexible black film in the center portion of the basket.

CAUTIONS:

- Do *not* lift the developer unit by grasping the toner cartridge. The cartridge may pop off and spill toner.
- Be careful not to touch the roller on the developer unit. Also, do not touch the green drum on the drum unit.

4. Replace the drum unit and developer unit in the basket.

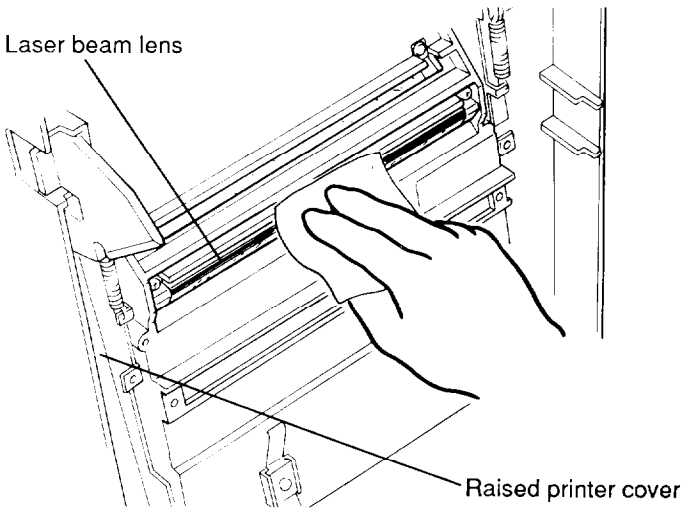
Cleaning the laser beam lens

Note: Cleaning the lens is required at an interval of 10,000 pages (the same interval as for changing the drum). If you wish, you can clean the lens when you change the drum and skip this procedure when you change the toner cartridge. If you plan to skip this procedure, go to step 3 for printer reassembly information.

Follow these steps to clean the laser beam lens:

1. Locate the lens, which is the clear plastic component inside the top cover of your printer. Clean the lens with a lens cleaning cloth or other clean, soft cloth.

CAUTION: Do not use alcohol to clean the lens.



2. To ready your printer for printing, reinstall your basket. (Press down simultaneously on the drum unit's two green handles until the drum unit clicks into place.) Then close the printer cover. Plug in the power cord and turn your printer back on.

General Printer Maintenance

In addition to the maintenance called for by the display panel messages, the following simple maintenance procedures may be occasionally necessary:

- Cleaning the developer unit. You should clean the developer unit if vertical white lines appear on your printed page.
- Cleaning the main charger wire. You should clean this wire if print quality declines.

These procedures are described below.

Cleaning the developer unit

If vertical white lines appear on your printed page, you need to clean the developer unit with the developer cleaner. Follow these steps:

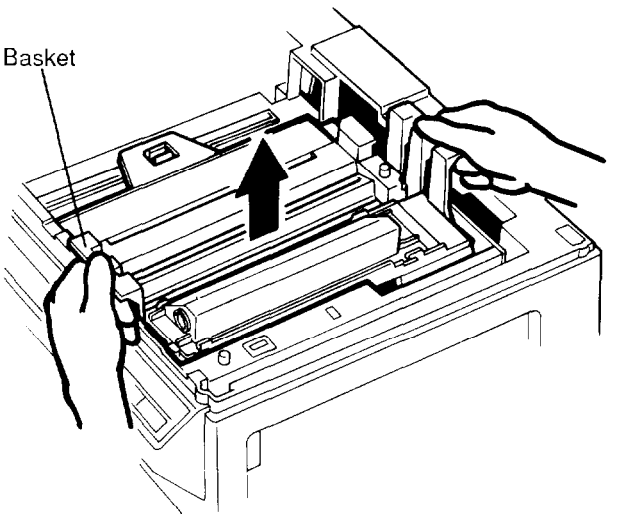
1. Locate the developer cleaner. **A** cleaner is included with the accessory pack that comes with your printer. A cleaner is also packed with replacement drum units.

2. Raise the top cover of your printer by lifting up on the latch.

WARNINGS:

- Opening the printer exposes the fuser, the orange area marked with a caution label. This unit is very hot, so be careful not to touch it.
- This procedure exposes **the** green drum unit. Because the drum is light-sensitive, it should not be exposed to room light for any longer than necessary (a few minutes at most). Thus, it is recommended **that you** cover the drum unit with **a** soft cloth or sheet of paper whenever the drum is exposed.

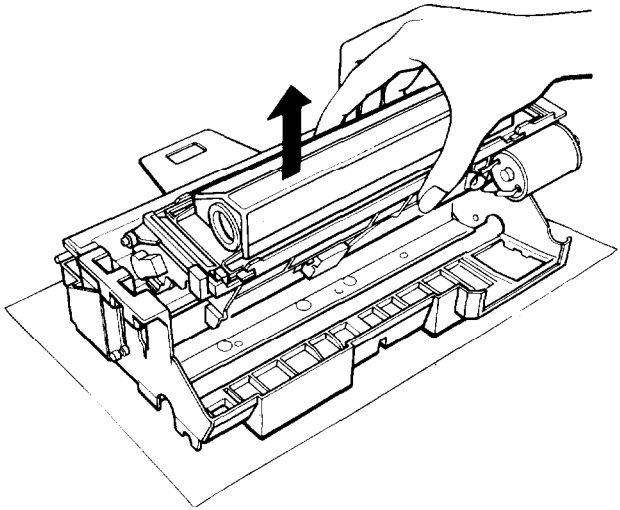
3. Remove the basket from **the** printer and place it on a flat surface.



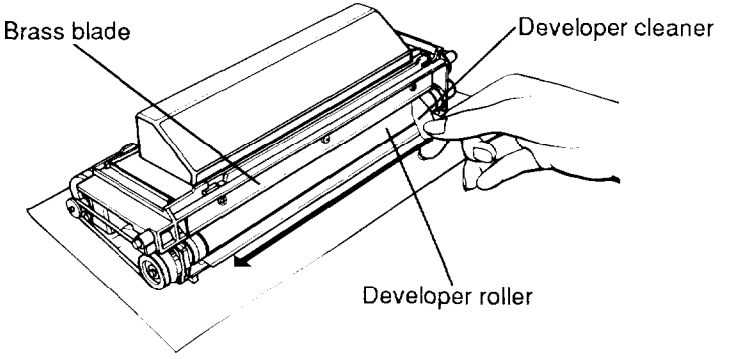
4. Protect your desktop or other flat surface by covering it with a sheet of paper. Then remove the developer unit from the basket and place it on the paper.

CAUTIONS:

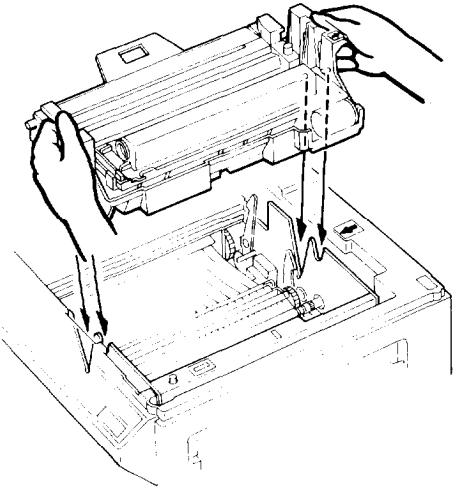
- Do not lift the developer unit by grasping the toner cartridge. The cartridge may pop off and spill toner.
- Be careful not to touch the roller on the developer unit.



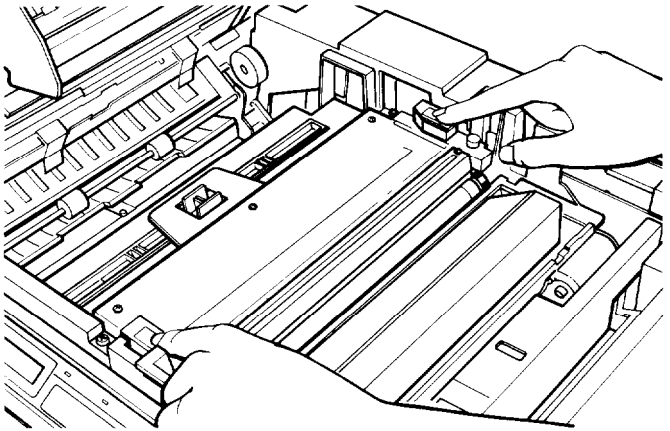
5. Insert the hooked edge of the developer cleaner about a half inch (13 mm) between the developer roller and the brass blade, as shown below. Draw the cleaner the full length of the developer unit several times, discarding excess toner. Then reinstall the developer unit in the basket.



6. With the top cover of the printer open, align the arrow on the back of the basket with the arrow on the printer case. (The arrows point toward each other when the unit is properly installed.) Gently lower the basket into place.



7. Press down simultaneously on the drum unit's two green handles until the drum unit clicks into place.



8. Close the printer cover by pressing down on the ridged area on the right side of the cover.

Cleaning the main charger wire

Note: Locate some alcohol for cleaning purposes before beginning this procedure.

1. Turn off the printer and disconnect the printer cable from the wall outlet.
2. Open the printer cover and remove the basket from the printer. Place the basket on a flat surface.

WARNINGS:

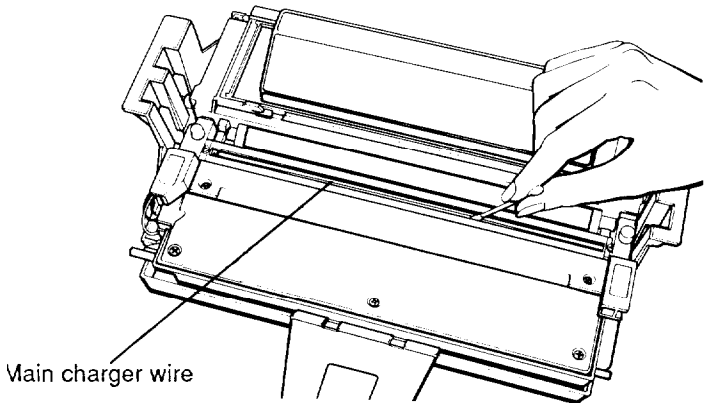
- Opening the printer exposes the fuser, the orange area marked with a caution label. This unit is very hot, so be careful not to touch it.
- This procedure exposes the green drum unit. Because the drum is light-sensitive, it should not be exposed to room light for any longer than necessary (a few minutes at most). Thus, it is recommended that you cover the drum unit with a soft cloth or sheet of paper whenever the drum is exposed.

3. Locate the main charger wire, which extends along the length of the green drum inside a slot directly over the drum. This wire is thin and difficult to spot instantly.

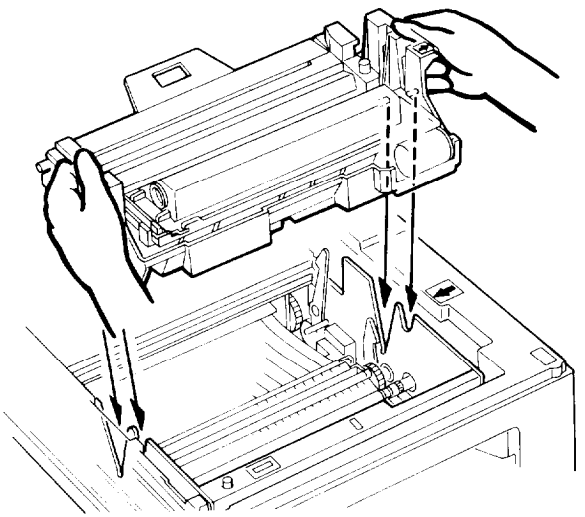
CAUTIONS:

- When cleaning the main charger wire, be careful not to press too hard. The wire is delicate and can break if you apply too much pressure to it.
- Avoid dripping alcohol on the drum.

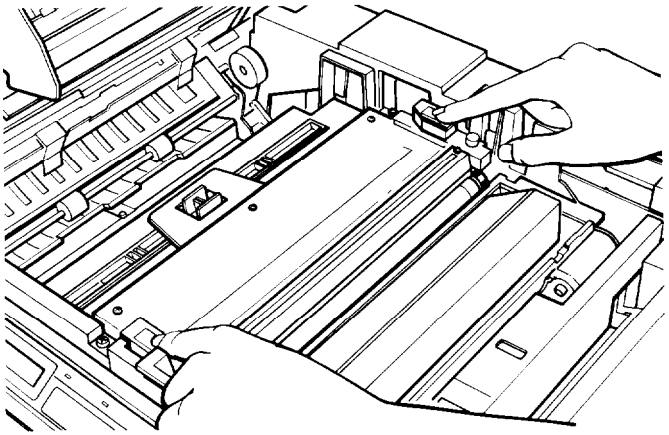
4. Gently clean the main charger wire with a cotton swab dipped in alcohol. Run the swab along the length of the wire. You need to insert the cotton swab a fraction of an inch into the slot to reach the wire.



5. With the top cover of the printer open, align the arrow on the back of the basket with the arrow on the printer case. (The arrows point toward each other when the unit is properly installed.) Gently lower the basket into place.



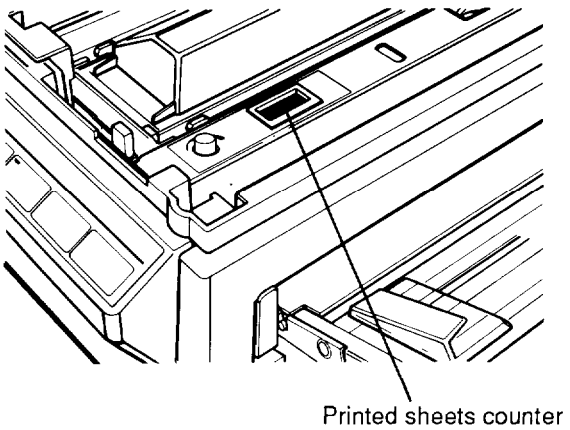
6. Press down simultaneously on the drum unit's two green handles until the drum unit clicks into place.



7. Close the printer cover by pressing down on the ridged area on the right side of the cover.
8. Plug in the power cord and turn your printer back on.

Service Overhaul

A service overhaul must be performed at 100,000 pages by an Epson Customer Care Center. Call 1-800-922-8911 for a referral. Periodically check the printed sheets counter inside the printer on the right side. When the printed sheets counter reaches 100,000 pages, take the printer in to your dealer for servicing.



Transporting Your Printer

If you need to move the printer a short distance, such as from one room to another, make sure that you keep the printer level.

If you are shipping the printer, you need to repackage the printer and its accessories. Read and carefully follow the instructions below. Also make sure that the shipper takes adequate precautions to avoid damaging the printer.

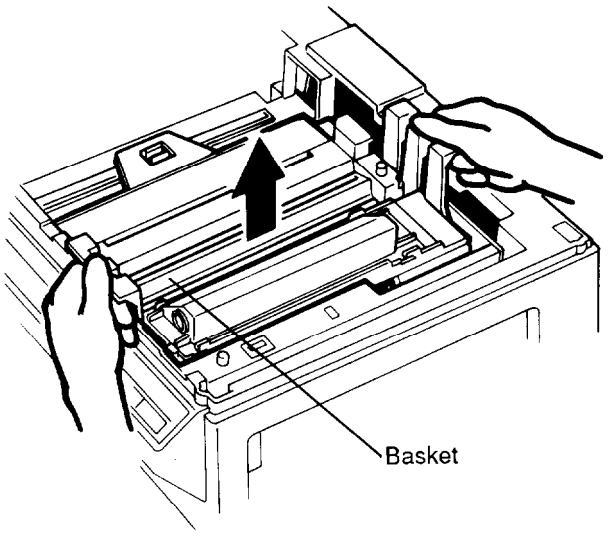
CAUTION: Do not ship the printer with the drum unit and developer unit installed in the printer. Also, do not vacuum toner out of **the** developer unit.

Packing for transportation

To pack **the** printer you **need** all the original packing materials that came with the printer and **some** packing tape. You also need two large plastic bags for packing the drum unit and developer unit, to contain **any** toner displaced during shipping.

Prepare **the** printer for transportation by following the steps below:

1. Be sure that your printer and computer are turned off.
2. Remove the power cord and **the** cable connecting your printer and computer.
3. If there is a cartridge in the cartridge slot, remove it.
4. Remove **any** paper still in the paper cassette. Then remove the paper cassette and **the** face-up output tray from the printer. Repackage **each** tray in its original packing material.
5. Open **the** printer using the latch at the front.
6. Lift out the basket and place it on a flat surface.

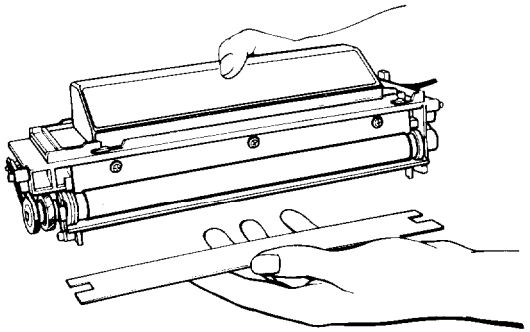


7. Remove the drum unit from the basket by lifting **up** on the green handles. (Avoid touching or scratching the green drum.) Place the drum in a plastic bag and seal the bag. Then wrap the drum it its original packing materials. (Be sure to use the black plastic wrapper to protect the drum from light.)

8. Remove the developer unit from the basket. (Be sure not to touch the roller on the developer unit.)

> CAUTION: Do not lift the developer unit by grasping the toner cartridge. The cartridge may pop off and spill toner. Also, do not remove the toner cartridge from the developer unit.

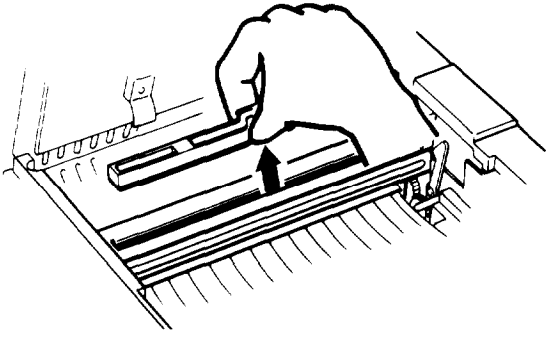
9. Locate the red plastic protector, which was included with the original packing materials. Place the protector under the developer, fitting the gaps on the protector around the hooks directly beneath the developer roller.



10. Place the developer unit in **a** plastic bag and seal the bag. Then wrap the unit **in** its original packing **materials.**

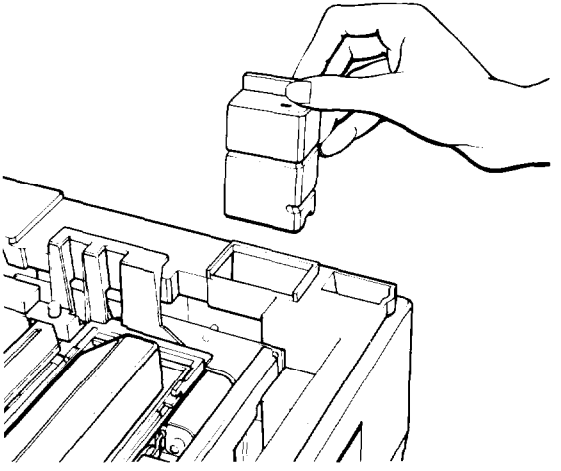
11. Locate the cleaning pad, which is embedded in the orange-colored fuser inside the printer. Carefully take hold of the green felt handles on the cleaning pad and lift out the pad. (Be careful not to let dirt from the pad drop into the printer.)

WARNING: If the printer has been in use recently, the fuser and the cleaning pad may be very hot. Be careful to touch only the green felt handles on the pad when you remove it. Do not touch the fuser or the pad itself.

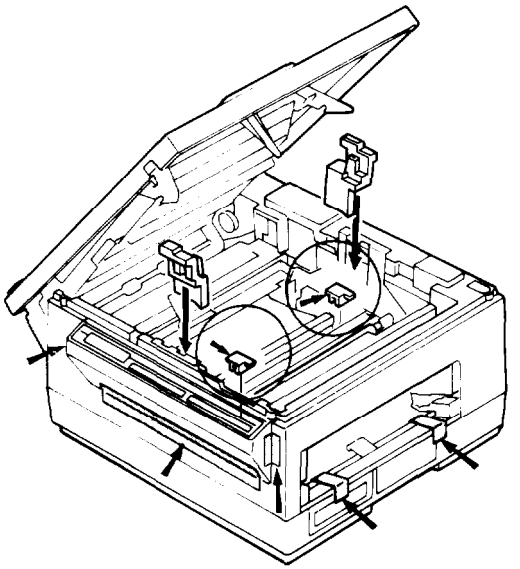


12 Pack the cleaning pad in its original packing material.

13. Pull out the drum replacement cartridge from its slot and wrap it in its original packing material.

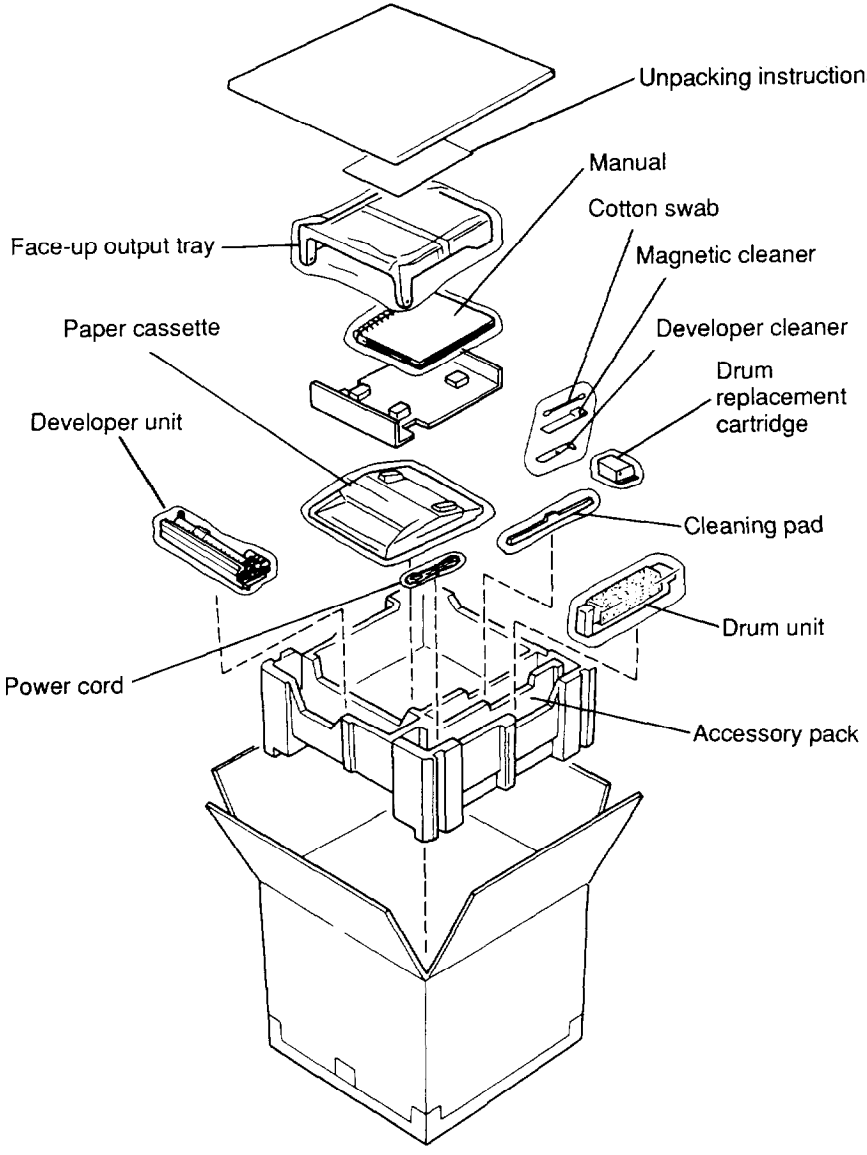


14. Put the empty basket back in the printer. Replace and tape the packing foam inside the printer **as** shown below to hold the basket in place.

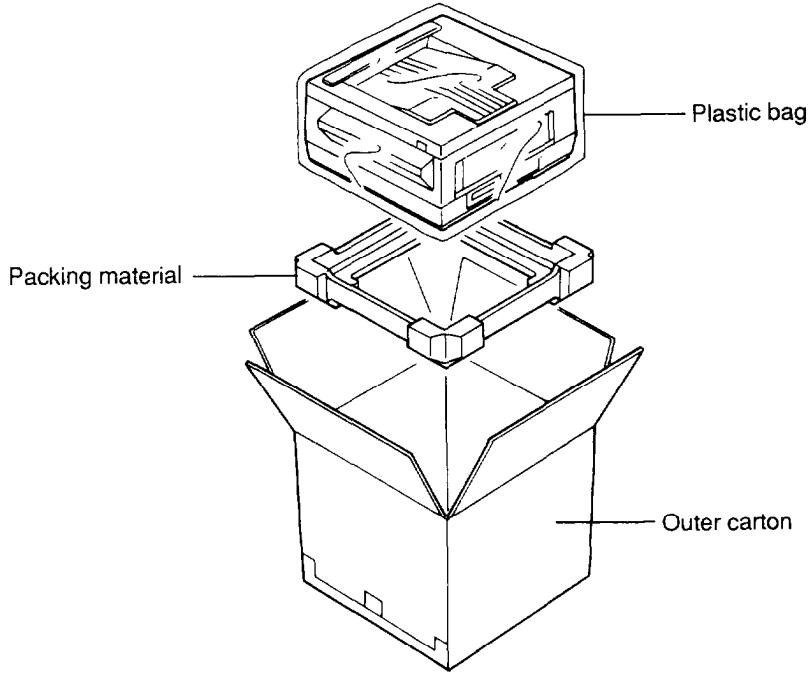


15. Close the printer cover.

16. Repack all accessories in the accessory pack.



17. Pack the printer in its original packing material and put it in the outer carton.



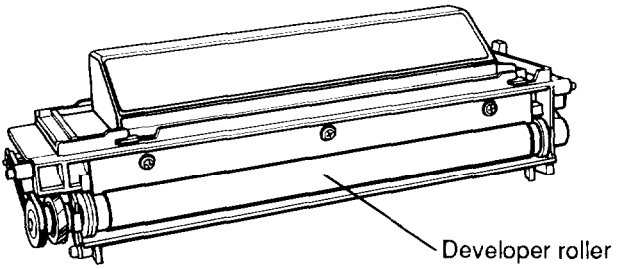
18. Place the accessory pack in the outer carton on top of the printer.
19. Seal the outer carton with packing tape.

Unpacking the Printer after Shipment

1. Unpack the printer as described in Chapter 1. When you unpack the developer unit and drum unit, wipe off any excess toner that is on these units.

CAUTIONS:

- Do *not* wipe or vacuum toner off the roller on the developer unit. Avoid touching this roller.



- Be careful not to scratch or mar the green drum. Also, do not touch the drum with your fingers, since oils from your skin can permanently mar its surface and affect print quality.

2. Before reassembling the printer, perform the routine cleaning procedures described beginning on page 6-19. (Skip the step on readying your printer for printing.)
3. Assemble the printer as described in Chapter 1.
4. Follow the instructions on setting the paper feed mechanism in Chapter 1, page 1-23. This procedure causes the paper feed mechanism, which can become misaligned during shipping, to resume its original position.

Chapter 7

Troubleshooting

Error Messages. 7-2

Paper Jam Problems 7-7
Insertion error 7-7
Paper jam error 7-9

Troubleshooting. 7-12

Power Supply. 7-13

Printing Problems 7-14

Paper Handling 7-19

Decline in Print Quality 7-22

FX Problems and Solutions 7-25

7

Error Messages

This chapter discusses problems you may encounter with your printer and their likely solutions.

The first section of this chapter describes error messages and provides possible solutions. The remaining sections are designed to help you solve problems that may occur while you are using the printer.

When an error occurs, the error light comes on and a message appears in the display on the control panel. The message tells you what may be wrong and, in some cases, indicates the actions you should take to correct the problem.

This section contains a list of error messages you may encounter while printing. Each error message is followed by the steps you need to take to correct the problem.

Certain problems require service by an Epson Customer Care Center. Call the Epson Consumer Information Center at 1-800-922-8911 for a referral to a Customer Care Center.

Notes:

- When a problem has been corrected, you may need to press the **ON LINE** button to resume printing.
- Certain problems require that you press the **CONTINUE/RESET** button to continue printing. However, when the **AUTO CONT** SelecType option is set to **ON,** the printer automatically clears **the** error and resumes printing for the following error messages:

PS CHANGE	**ERROR 21**	**ERROR 40**
ERROR 20	**ERROR 22**	

  When the **AUTO CONT** SelecType option is set to **ON,** your printer resumes printing even though the problem may not have been fixed. This may cause a problem with your printed output.

CHANGE DRUM

The drum unit may not be installed properly. Open the printer and make sure the drum unit is seated properly in the basket. (Press down simultaneously on the drum unit's two green handles to make sure the unit has clicked into place.)

Also, the drum replacement cartridge may not be installed. Be sure to install a new drum replacement cartridge each time you replace the drum unit.

If the message remains, the drum unit and the drum replacement cartridge must be replaced. See the section on replacing the drum unit in Chapter 6.

COVER OPEN

The printer cover is open. Close the cover and press the **ON LINE** button to set the printer on line and begin normal printing.

ERROR 20

Not enough memory is available. Press the **CONTINUE/RESET** button to continue printing. Your page may be printed as two or more separate pages. This error can also be cleared by turning the printer off and back on again. It may be necessary to simplify your print job by downloading a smaller font, deleting some macros, or using a lower resolution. You may also wish to purchase the optional 2MB memory board available for this printer.

ERROR 21

The page is too complex to print. Press the **CONTINUE/RESET** button to eject the page and clear the error. This error can also be cleared by turning the printer off and back on again. Before you continue printing, simplify the page you are trying to print.

ERROR 22

The buffer has overflowed due to a communication protocol error. Make sure that your SelecType settings match the communication protocol settings of your computer. If the problem persists, call the toll-free number for a Customer Care Center referral.

ERROR 40

A parity or baud rate error has occurred. Press the **CONTINUE/RESET** button to clear the error. Make sure your SelecType settings match your computer configuration. If the problem persists, call the toll-free number for a Customer Care Center referral.

FONT CART ERROR

The font cartridge selected using the **FONT SOURCE** SelecType option is not installed properly. Turn the power off. Then remove the cartridge and reinsert it. Turn the power back on and resend the print job. If the problem persists, make sure that the correct **FONT SOURCE** option has been selected in SelecType. See the section on SelecType in Chapter 3 for details.

INSERTION ERROR

There is a paper feeding problem. See the section on paper jams in this chapter for details.

PAPER EMPTY

There is no paper in the paper cassette, or the paper cassette is not installed properly. Load more paper into the paper cassette or properly install the cassette. See Chapter 4 for details.

PAPER JAM

Paper is jammed inside the printer. See the section on paper jams in this chapter.

Note: If the printer was recently transported, the paper feed mechanism may need to be aligned. See the section on setting the paper feed mechanism in Chapter 1 for details.

PAPER SIZE ERROR

If you press the **ON LINE** button to override the **PS CHANGE** message, this message appears as your print job ejects to remind **you** to change the paper and SelecType **PAPER SIZE** option. See **PS CHANGE** below.

PS CHANGE

Your application software has requested a paper size that does not match your SelecType setting or paper. Press the **CONTINUE/RESET** button to clear the error; the printer is set off line.

Note: If you are using a non-standard paper size (one that is not listed on the **PAPER SIZE** menu in the SelecType), manual feeding may be necessary. See Chapter 4 for details.

After clearing the error, you have two options:

1. Change the paper in the cassette; then enter SelecType and change the paper size to match. Press the **ON LINE** button after exiting SelecType to continue printing.
2. Alternatively, press the **ON LINE** button to continue printing on **the** current paper. (The message **PAPER SIZE ERROR** appears in the display.) See **PAPER SIZE ERROR** above.

TONER EMPTY

The developer unit may not be installed properly. Open the printer and make sure the developer unit is seated properly in the basket.

If the message remains, the toner is low and you must replace the toner cartridge. See the section on replacing the toner cartridge in Chapter 6.

CPU ERROR	**ERROR 30**
ERROR 10	**ERROR 31**
ERROR 11	**ERROR 32**
ERROR 12	**ERROR 33**

If one of these error messages appears, follow the steps below.

1. Press the **CONTINUE/RESET** button.
2. If the error does not clear, turn the printer off for at least five seconds. Then turn it back on.
3. If the problem remains, service is required. Call 1-800-922-8911 for the location of the nearest Epson Customer Care Center.

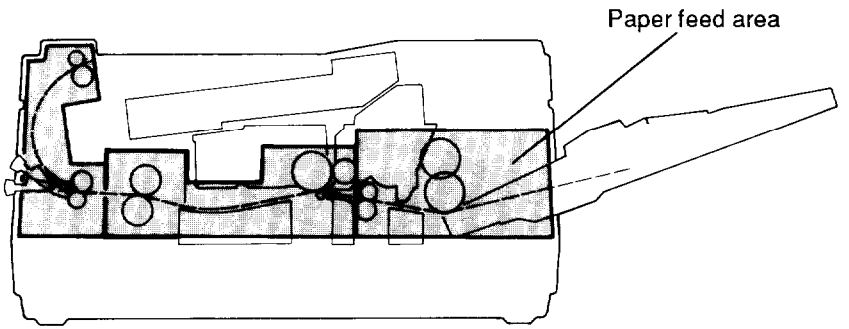
Paper Jam Problems

This section gives you detailed information on correcting paper jams, which are indicated by a **PAPER JAM or** an **INSERTION ERROR** message.

CAUTION: If the paper tears while you are removing it, make sure you remove any pieces still remaining in the printer.

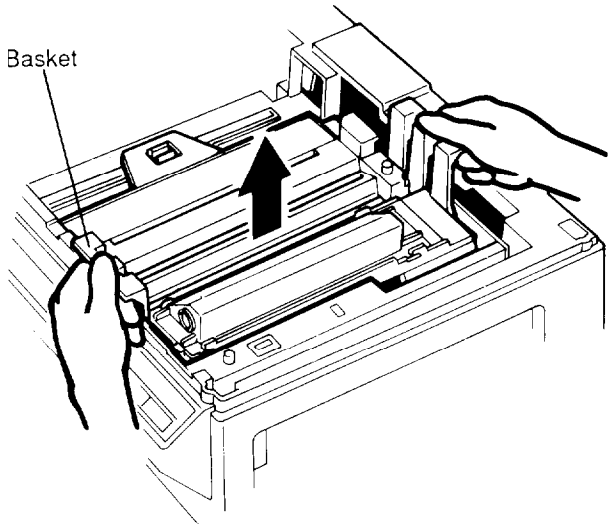
Insertion error

If the **INSERTION ERROR** message appears, the jam is in the paper feed area. To remove the jammed paper, follow the steps below.

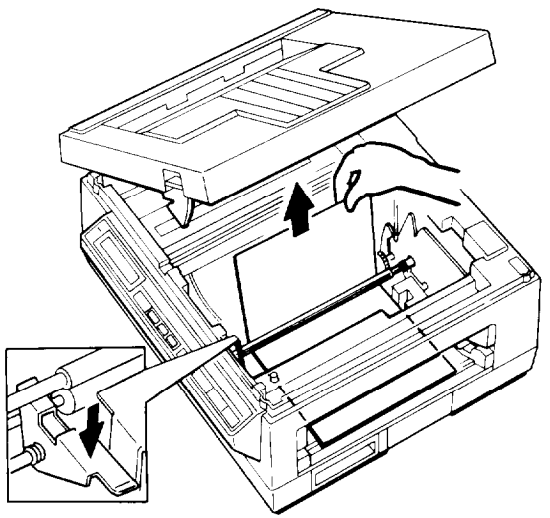


1. Remove the paper cassette.

2. Open the cover. Remove the basket from the printer.



3. Hold down the green release lever, located inside the front of the printer, to release the paper.



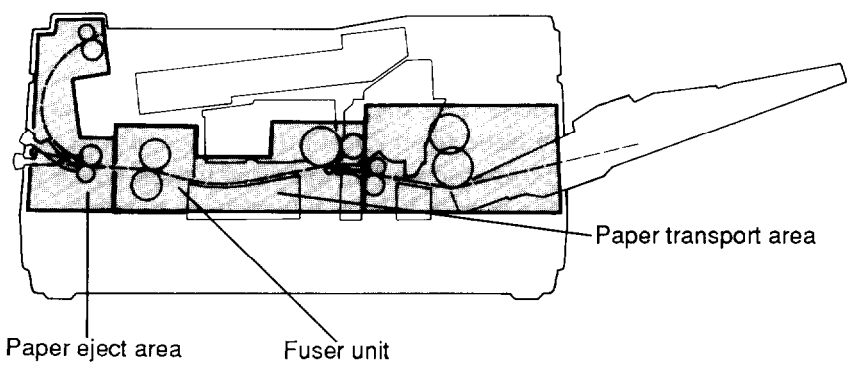
4. While holding down the release lever, remove the jammed paper. Then let go of the release lever.
5. Reinstall the basket by aligning the arrow on the back of the basket with the arrow on the printer case and lowering the basket into place.
6. Press down simultaneously on the drum unit's two green handles until the unit clicks into place.
7. Close the cover.
8. Reinsert the paper cassette into the printer so that the arrow on the side of the cassette points into the printer. Push the cassette in until it can go no further; then lower the end of the cassette (the end you load paper into) until the cassette drops into place.

> CAUTION: It is particularly important to lower the cassette into place. If the cassette is not installed properly, the message **PAPER EMPTY** appears in the display.

9. Press the **ON LINE** button to resume printing.

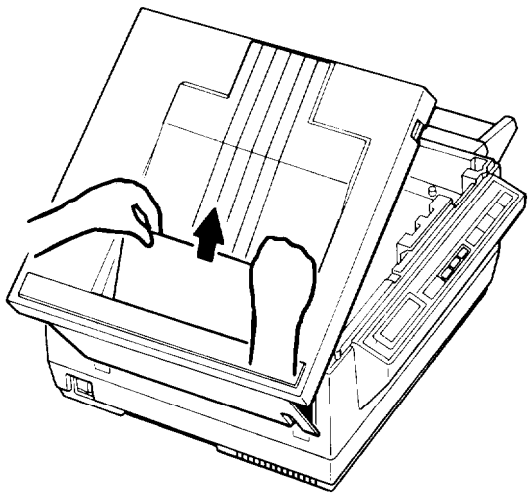
Paper jam error

If the **PAPER JAM** message appears, the jam is either in the paper eject area or the paper transport area as shown below.



Note: If the printer was recently transported, the paper feed mechanism may need to be aligned to prevent further jamming. See the section on setting the paper feed mechanism in Chapter 1 for details.

If the paper is jammed in the paper eject area, you can see it sticking out of either the face-up or face-down output tray depending upon the paper path selected. Simply remove it by pulling it out of the printer.

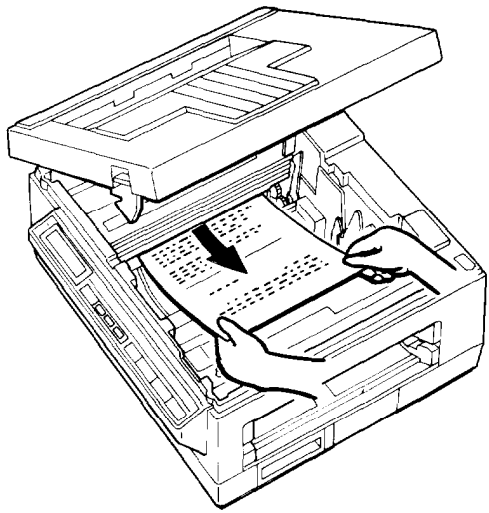


If the jam is in the paper transport area, follow the steps listed below.

CAUTION: Because the toner on the paper inside the printer may not have been fixed on the page, avoid contact with it; it may come off on your hands while you are removing the paper. When you resume normal printing, the first page through the printer may be soiled with excess toner.

1. Open the printer.
2. Lift out the basket as shown previously in this section.
3. Remove the jammed paper.

WARNING: If it is necessary to pull it from beneath the fuser unit, be careful not to touch the fuser unit, which becomes hot during printer operation.



4. Reinstall the basket by aligning the arrow on the back of the basket with the arrow on the printer case and lowering the basket into place.
5. Press down simultaneously on the drum unit's two green handles until the unit clicks into place.
6. Close the cover.
7. Press the **ON LINE** button to set the printer on line and resume printing.

Troubleshooting

This section discusses problems you may encounter and their likely solutions. (Paper jam problems are discussed earlier in this chapter.) Locate the problem in the list below and work through the suggested solutions. If the exact problem is not listed, look for one of a similar type. Many of the problems may not be as serious as you first think and can be corrected easily.

FX emulation problems are covered at the end of this chapter.

If the suggestions below do not solve the problem, call the Epson Consumer Information Center at 1-800-922-8911 for the location of the nearest Epson Customer Care Center.

Power Supply

Problem	Solution
Power is not being supplied to the printer.	
After turning on the printer, the display remains blank.	The power cord may be disconnected or may not be completely plugged in. Turn off the printer and check the power cord connections at the printer and at the electrical outlet. Then turn the printer back on. Check to see if the power cord is damaged. If it is, replace it with a new power cord. The problem may be with the electrical outlet itself. If the outlet is controlled by an outside source such as a wall switch, make sure it is on. If the printer still does not operate, the outlet may be faulty. Plug another electrical device into the outlet to check whether the outlet is operating properly.

Printing Problems

Problem	Solution
The printer does not print or stops printing.	
*The **ON LINE** message appears but nothing is printed.*	The interface cable may not be plugged in securely. Check both ends of the cable between the printer and the computer. If you are using a parallel interface, secure the connector using the wire retaining clips. You may not be using the correct interface cable. Make sure that your interface cable meets the specifications for the printer and computer. You may not have selected the correct interface settings with SelecType. Select the appropriate interface (serial or parallel). If you are using a serial interface, also set the baud rate, protocol, data bit, and related settings. See Chapter 3 for information on using SelecType. Also check your computer manual for interface requirements. You may not have set the DIP switches correctly. DIP switches must be set for either the RS-232C or the RS-422A serial interface. (Not required for a parallel interface.) See Chapter 2 for details.

Problem	Solution
The ON LINE *message appears but nothing is printed (continued).*	Your software may not be installed properly for your printer. Make sure the currently selected printer mode matches your program's printer driver.
The test prints do not print.	The printer must be set off line when running a test print. You may have installed an incompatible font cartridge. Try the test print again without the cartridge installed, or with a different cartridge. If the problem continues, service by an authorized Epson Customer Care Center is needed.
The printer stops printing and the display reads ***CHANGE DRUM, TONER EMPTY,*** *or* ***PAPER EMPTY.***	Replace the component specified. See Chapter 4 for paper loading instructions. See Chapter 6 for toner and drum replacement instructions.

Problem	Solution
The printout is not what you expected.	
The font selected by your software cannot be printed.	Make sure that all of the attributes of the requested font match the attributes of an available font. (These attributes include orientation, symbol set, spacing, pitch, point size, style, weight, and typeface.) Otherwise, a font you don't expect may be selected. For example, simply requesting a typeface or point size may not be sufficient to select the desired font. Your software may be overriding the font **chosen** with SelecType. Make sure your software settings match the settings in SelecType. Also, the font selected by your software may not be available. Be sure you have installed the correct font cartridge or have downloaded the correct soft font.
Completely blank pages are printed.	Run a status print test (as described in Chapter 2) to check that the interface configuration for your computer matches the SelecType settings. Change the SelecType settings if necessary. If blank pages continue to print, check to be sure the drum unit is installed properly. If the problem persists, replace the drum and drum replacement cartridge as described in Chapter 6.

Problem	Solution
Characters belonging to a different symbol set are being printed.	The expected symbol set may not be available in the printer. Be sure you have installed the correct font cartridge or have downloaded the correct soft font. The correct symbol set may not be selected. Specify the desired symbol set with your software or with SelecType. See Appendix A for information on symbol sets.
Some or all of the output is garbled or printed as asterisks.	The interface cable may not be plugged in completely. Make sure that both ends of the cable are plugged in securely. The interface may not be configured correctly. If you are using a serial interface, make sure that your serial interface settings are set correctly in SelecType and that they match the settings for your computer. See Chapter 3 for details. Try running a self test print as described in Chapter 2. If this fails to print correctly, call 1-800-922-8911 for a referral to an Epson Customer Care Center.
Graphic images do not print.	You may not have the correct printer driver installed. If you try to print with a software package set for another printer, nothing will be printed. Make sure that the driver matches the currently selected operating mode.

Problem	Solution
The position of the printout is not what you expected.	
The printed page length differs from the actual length of the paper.	The SelecType FORM setting may not be correct or your software may be overriding it. Enter the HP emulation submenu and check the setting. The default setting is 60 lines. Check the page length and top margin settings for your application program to ensure that they are set correctly.

Paper Handling

Problem	Solution
Paper does not feed properly.	
Paper does not feed at all.	Paper may be loaded incorrectly. Check to see that the paper is loaded correctly. See Chapter 4. If the manual light is on, the printer is set for manual printing. Set the printer off line, then press the **MANUAL** button to return to automatic print mode. See Chapter 4 for details.
Paper becomes crooked as it feeds into the printer.	The paper guides may not be adjusted correctly. Set the position of the guides so that the paper can slide in and out freely. If the paper guides are too tight, they can cause **the** paper to bind; if they are too loose, the paper may feed crookedly into the printer. See Chapter 4 for details. If you have just transported your printer, **the** paper feed mechanism may be misaligned. See **the** section on setting the paper feed mechanism in Chapter 1.

Problem	Solution
Paper does not feed properly (continued).	
More than one page at a time feeds into the printer.	You may not have fanned the paper sufficiently to ensure smooth paper feeding. If the paper has jammed, remove the jammed sheet or sheets as described in the section on paper jams in this chapter. Remove the paper from the paper cassette, fan it, and reinsert it in the cassette. Then try printing again. Also, remember that poor quality paper can cause paper feeding errors of this type. Make sure your paper supply is not too thin or too rough. If you are using manual feed, be sure the paper cassette is about half-full to prevent feeding from the paper cassette. See Chapter 4 for information on the types of paper that can be fed automatically and the types that require manual feeding.
The paper feeds but then jams at the output area.	There may be too much paper in the output tray. Never let more than 20 sheets of paper accumulate in the face-up output tray, or more than 150 sheets accumulate in the face-down output tray on top of the printer.

Problem	Solution
The display reads ***PS CHANGE.***	You may be trying to use a non-standard paper size (one that is not listed on the **PAPER SIZE** menu in SelecType). You may be able to feed this paper using the manual paper feed option described in Chapter 4. See the Error Messages section for more information on this message.

Decline in Print Quality

Problem	Solution
The print quality is not what you expected.	
The printed page is dirty, vertical bands or streaks appear on the page, or the print quality is uneven.	Printer components may not be properly installed. Make sure the developer unit and drum unit are properly installed. Printer components may be dirty. To clean components, follow the steps in the Routine Printer Cleaning section in Chapter 6. Also clean the main charger wire as described in the General Printer Maintenance section in Chapter 6.
Vertical white bands or lines appear on printed pages.	Printer components may be dirty. To clean components, follow the steps in the Routine Printer Cleaning section in Chapter 6. The developer unit may be dirty. Clean the developer unit as described in the General Printer Maintenance section in Chapter 6.
Ghost images appear on printed pages.	The drum and drum replacement cartridge need to be replaced. Replace the drum and drum replacement cartridge as described in Chapter 6.

Problem	Solution
Periodic black or white spots appear on the printout.	The drum may be dirty, stained, or damaged. Remove the basket and carefully remove the drum unit. Then clean it with a soft, dry cloth that is free of lint. (Do not touch the surface of the drum with your fingers. The oils from your skin can permanently damage the drum.) Reinstall the drum unit and replace the basket. Check the print quality. If the problem persists, replace the drum and drum replacement cartridge as described in Chapter 6.
Individual characters appear uneven or broken.	You may not be using the correct type of paper for your printer. If the surface of your paper is too rough, printed characters appear distorted or broken. Smooth, high-quality copier paper or paper specifically designed for laser printers is recommended for best results.
The printed image is light or faint.	Your paper may be moist or damp. Printing is sensitive to moisture absorbed by the paper. The higher the moisture content in the paper, the lighter the printed output. Do not store your paper in a humid or damp environment.
The non-printed side of *the page is dirty.*	The printer needs to be cleaned. Follow the steps in the Routine Printer Cleaning section in Chapter 6.

Problem	Solution
The paper curls. *Printed pages are curled.*	You may need to turn over the stack of paper in your paper cassette and try printing again. Most paper has a natural "curl" that may be emphasized when the paper is nm through a laser printer. One side of the paper tends to curl more than the other side. Another way to minimize paper curl is to use the face-up output tray. This tray provides a straight-through paper path, reducing excessive curling. To select face-up printing, move the paper path selector on the left side of the printer to the down position. **If the SPECIAL** button is set for the high fusing temperature **(the** # symbol is displayed), press the button to select the lower temperature setting (the # symbol is **no** longer displayed). (However, the lower temperature is not recommended for envelopes or heavy paper.) If these suggestions do not help, it is recommended that you use a different type of paper.

FX Problems and Solutions

This section discusses problems you may encounter while using FX emulation and their likely solutions.

If these suggestions do not solve the problem, call the Epson Consumer Information Center at 1-800-922-8911 for a referral to an Epson Customer Care Center.

Problem	Solution
The printout is spaced incorrectly.	
All the text is printed on the same line.	**A** line feed command is not being sent at the end of each line of text. Set the AUTO LF function in SelecType to **CR + LF.**
There is an extra blank line between each line of text.	An extra line feed signal is probably being sent. Set the **AUTO LF** function in SelecType to CR.
The position of the printout is not what you expected.	
The printed page length differs from the actual length of *the paper.*	Your SelecType **TOP OF FORM setting** or application settings may not be correct. Check your SelecType **TOP OF FORM** setting. Also check the page length and top margin settings for your application program to ensure that they are set correctly for the desired page length. Make sure your software is sending a Form Feed (FF) command at the end of each page.

Problem	Solution
The printout is not what you expected.	
FX emulation is not selected even after you set it in SelecType.	Your printer may not have been reset after you changed your SelecType settings. After you have set FX emulation in SelecType and exited SelecType, you must reset the printer by holding down the CONTINUE/RESET button for three seconds, until the message **RESET** appears. This procedure implements your SelecType settings.
Incorrect characters are printed.	The wrong international character set may be selected. See the FX emulation submenu options section in Chapter 3 of this manual. The wrong character table (italics or Epson Extended Graphics) may be selected. See the FX emulation submenu options section in Chapter 3.
Some or all of the output is garbled or printed as asterisks.	The printer cable may not be securely connected to the printer or computer. Check both ends of the cable.

Problem	Solution
The selected font, page layout, or other settings are not printing as expected.	Your application software's settings **may** not be selected properly. See that your software is correctly set up for your printer. Your application program may be changing SelecType settings. Use the program's setup procedure to remove codes **that** interfere with SelecType, or use the printer control codes for your application program instead of SelecType. (See your software manual.)
Data remains in the buffer after printing.	
The message ***DATA IN BUFFER*** *appears in the display after a document has been printed.*	Some data remains in the printer's buffer. Press the **CONTINUE/RESET** button to print the data. You should make sure that your software sends a Form Feed (FF) command at the end of **each** page.

Appendix A

Character Samples and Symbol Sets

HP Mode Resident Fonts **A-2**
Character samples A-2
Symbol set tables A-3

FX Mode Character Tables. A-9
Italic character set A-10
Epson Extended Graphics character set. A-11

Converting Hexadecimal Values to Decimal Values A-12

HP Mode Resident Fonts

The HP mode fonts resident in the laser printer are listed below. The cartridge slot on your printer lets you access a wide variety of other fonts available on font cartridges.

Font Name	Point Size	Orientation
Courier	12 point	portrait
Courier	12 point	landscape
Courier bold	12 point	portrait
Courier bold	12 point	landscape
Line printer	8.5 point	portrait
Line printer	8.5 point	landscape

Character samples

The font samples below show only portrait orientation since the character itself is the same in portrait or landscape orientation.

Courier 12 point portrait

Courier bold 12 point portrait

Line printer 8.5 point portrait

Symbol Set Tables

This section includes a character table for each symbol set in the HP emulation mode that can be selected with SelecType and a substitution chart for the ISO symbol sets (also available through SelecType).

The symbol set tables in this section show you the available characters and hexadecimal codes.

To locate the hexadecimal value for a character, find the character on the table. Move to the top of the column for the first digit of the hex character. Then move to the left of the row for the second digit. For example, the character **Z** has a hexadecimal value of 5A.

To locate the decimal value for a character, determine the hexadecimal value for the character, then use the chart at the end of this appendix to convert the hexadecimal value.

Note: The ID number under each symbol set name provides the unique portion of the escape sequence needed to select that particular symbol set. (This ID number also appears on the font test print which is described in Chapter 2.) For more information on escape sequences, see Chapter 5.

Roman-8

Symbol Set ID # 8U

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				¯	â	Å	Á	Þ
1			!	1	A	Q	a	q			À	Ý	ê	î	Ã	þ
2			"	2	B	R	b	r			Â	ý	ô	Ø	ã	·
3			#	3	C	S	c	s			È	°	û	Æ	Đ	µ
4			$	4	D	T	d	t			Ê	Ç	á	å	ð	¶
5			%	5	E	U	e	u			Ë	ç	é	í	Í	¾
6			&	6	F	V	f	v			Î	Ñ	ó	ø	Ì	-
7			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó	¼
8			(	8	H	X	h	x			´	¡	à	Ä	Ò	½
9			)	9	I	Y	i	y			`	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z			^	¤	ò	Ö	õ	º
B			+	;	K	[	k	{			¨	£	ù	Ü	Š	«
C			,	<	L	\	l	|			~	¥	ä	É	š	■
D			-	=	M	]	m	}			Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~			Û	ƒ	ö	ß	Ÿ	±
F			/	?	O	_	o	▒			£	¢	ü	Ô	ÿ	

ECMA-94 Latin 1

Symbol Set ID # ON

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}				½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▒			¯	¿	Ï	ß	ï	ÿ

IBM US (PC-8)

Symbol Set ID # 10U

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		►		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	•
A	◙	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	η
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	▩	Å	ƒ	»	┐	╧	▀	∩	

IBM Denmark/Norway (PC-8 D/N)

Symbol Set ID # 11U

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▶		0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2	☻	↕	"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	▒	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	▒	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	▒	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	õ	▒	╞	╓	μ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	Õ	▒	╟	╫	τ	≈
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	▒	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ã	▒	╔	┘	Θ	•
A	◙	→	*	:	J	Z	j	z	è	Ü	Ã	▒	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	ø	ℓ	▒	╦	▒	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	ñ	▒	╠	▒	∞	η
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	▒	═	▒	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	Ł	³	▒	╬	▒	∈	▪
F	☼	▼	/	?	O	_	o	▓	Å	ł	¤	▒	╧	▒	∩	

ISO substitution characters

The decimal numbers in the top row show the characters that differ from Roman-8 for each of the ISO symbol sets listed in the first column.

ISO	Name	ID	35	36	64	91	92	93	94	96	123	124	125	126
6	ASCII	OU	#	$	@	[	\	]	^	`	{	|	}	~
2	IRV	2U	#	¤	@	[	\	]	^	`	{	|	}	¯
4	UK	1E	£	$	@	[	\	]	^	`	{	|	}	¯
25	French	OF	£	$	à	°	ç	§	^	`	é	ù	è	¨
69	French	1F	£	$	à	°	ç	§	^	µ	é	ù	è	¨
	German	OG	£	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
21	German	1G	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
15	Italian	01	£	$	§	°	ç	é	^	ù	à	ò	è	ì
14	JIS ASCII	OK	#	$	@	[	¥	]	^	`	{	|	}	¯
57	Chinese	2K	#	¥	@	[	\	]	^	`	{	|	}	¯
10	Swedish	3S	#	¤	@	Ä	Ö	Å	^	`	ä	ö	å	¯
11	Swedish	0S	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
	Spanish	1S	#	$	@	¡	Ñ	¿	°	`	{	ñ	}	~
17	Spanish	2S	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
85	Spanish	6S	#	$	·	¡	Ñ	Ç	¿	`	´	ñ	ç	¨
16	Port	4S	#	$	§	Ã	Ç	Õ	^	`	ã	ç	õ	°
84	Port	5S	#	$	´	Ã	Ç	Õ	^	`	ã	ç	õ	~
60	Norw 1	OD	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	¯
61	Norw 2	1D	§	$	@	Æ	Ø	Å	^	`	æ	ø	å	|

FX Mode Character Tables

Epson Extended Graphics and italic character sets are available with FX emulation. The tables in this section show you the characters and their hexadecimal codes. (International character sets are shown in Chapter 3.)

To locate the hexadecimal value for a character, find the character on the table. Move to the top of the column for the first digit of the hex character. Then move to the left of the row for the second digit. For example, the character Z has a hexadecimal value of 5A.

To locate the decimal value for a character, determine the hexadecimal value for the character, then use the chart at the end of this appendix to convert the hexadecimal value.

Italic character set

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				*0*	*@*	*P*	*`*	*p*
1			!	1	A	Q	a	q			*!*	*1*	*A*	*Q*	*a*	*q*
2			"	2	B	R	b	r			*"*	*2*	*B*	*R*	*b*	*r*
3			#	3	C	S	c	s			*#*	*3*	*C*	*S*	*c*	*s*
4			$	4	D	T	d	t			*$*	*4*	*D*	*T*	*d*	*t*
5			%	5	E	U	e	u			*%*	*5*	*E*	*U*	*e*	*u*
6			&	6	F	V	f	v			*&*	*6*	*F*	*V*	*f*	*v*
7			'	7	G	W	g	w			*'*	*7*	*G*	*W*	*g*	*w*
8			(	8	H	X	h	x			*(*	*8*	*H*	*X*	*h*	*x*
9			)	9	I	Y	i	y			*)*	*9*	*I*	*Y*	*i*	*y*
A			*	:	J	Z	j	z			*	*:*	*J*	*Z*	*j*	*z*
B			+	;	K	[	k	{			*+*	*;*	*K*	*[*	*k*	*{*
C			,	<	L	\	l	¦			*,*	*<*	*L*	**	*l*	*¦*
D			-	=	M	]	m	}			*-*	*=*	*M*	*]*	*m*	*}*
E			.	>	N	^	n	~			*.*	*>*	*N*	*^*	*n*	*~*
F			/	?	O	_	o				*/*	*?*	*O*	*_*	*o*	

Epson Extended Graphics character set

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2			"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4			$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5		§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6			&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7			'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	θ	∙
A			*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B			+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C			,	<	L	\	l	¦	î	£	¼	╝	╠	▄	∞	n
D			-	=	M	]	m	}	ì	¥	¡	╜	═	▌	ø	²
E			.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	∈	■
F			/	?	O	_	o		Å	ƒ	»	┐	╧	▀	∩	

Converting Hexadecimal Values to Decimal Values

If you prefer to use decimal values **instead** of hexadecimal values, you can convert the hexadecimal value with the chart below. Just read down in the column for the first digit of the hex value and across in the row for the second digit. Where the two intersect is the decimal value that corresponds to your hex value. For example, to find the decimal equivalent of hex 5A, look where column 5 intersects with row A. There you will find decimal 90.

Hex-to-Decimal Conversion Chart

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	12	28	44	60	76	92	108	124	140	156	172	188	204	2x)	236	252
D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

Appendix B

Technical Specifications

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Printer Specifications

Printing

Printing method:	Laser beam scanning and dry electrophotographic process
	Drum type: OPC
	Exposure: Laser beam scanning
	Fusing: Heat fixing
Resolution:	300 x 300 dpi
Print speed:	6 pages per minute (letter or A4)
First print:	Less than 21 seconds (letter / A4 face up)
Warm-up time:	Approximately 65 seconds at 73°F (23°C) with 512K RAM
Internal fonts:	6 font styles:
	Courier 12 pt. portrait 10 cpi Courier 12 pt. landscape 10 cpi Courier Bold 12 pt. portrait 10 cpi Courier Bold 12 pt. landscape 10 cpi Line Printer 8.5 pt. portrait 16.66 cpi Line Printer 8.5 pt. landscape 16.66 cpi
Cartridges:	1 cartridge slot available for font cartridges

Paper and paper delivery

Paper specifications: Epson does not recommend or guarantee the use of any particular brand of paper. Because paper characteristics are subject to change by individual manufacturers, it is the user's responsibility to ensure the quality of paper used with the printer.

Paper and any ink or glue on it must be able to withstand a temperature of 392°F (200°C) and a pressure of 800 gf/cm^2. It must also not be sensitive to silicon oil.

Paper weight: Cassette feed (plain paper):
16 to 27 lb. (60 to 101 g/m^2)

Manual feed (plain paper):
14 to 34 lb. (52 to 128 g/m^2)

Paper size: Standard sizes:

Type	Size
Letter	8.5 x 11 inches
Legal	8.5 x 14 inches
A4	210 x 297 mm (8.3 x 11.7 inches)
Executive	7.25 x 10.5 inches

Range* of *paper width and length:

Width	Length
Max 8.5 inches (216 mm)	14 inches (356 mm)
Min 3.2 inches (82 mm)	5 inches (127 mm)

Paper feed alignment and direction: Center alignment for all sizes; lengthwise direction for standard sizes

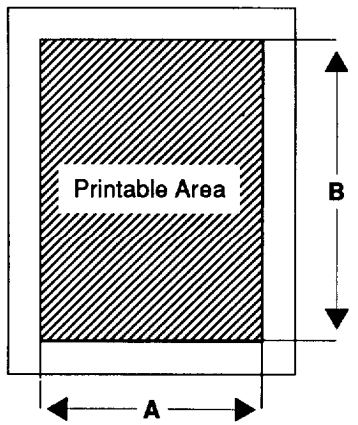
Paper feed: Cassette or manual feed (paper cassette capacity: up to 150 sheets of 20 lb. paper)

Paper eject: Face-up or face-down selection

Paper eject capacity:

Face-down: 150 sheets (20 lb. paper)
Face-up: 20 sheets (20 lb. paper)

Printable area:



Paper	A	B
Letter (8.5' x 11')	8.0"	10.6"
Legal (8.5' x 14')	8.0"	13.6"
A4 (210 x 297 mm)	202 mm	287 mm
Executive (7.25' x 10.5')	6.75'	10.1'

Mechanical

Dimensions and weight:	Height:	8.3 inches (210 mm)
	Width:	16.1 inches (410 mm) excluding output and input trays
	Depth:	15.4 inches (390 mm)
	Weight:	Approx. 36 lb. (16 kg) including paper cassette, drum unit, and toner cartridge
Recommended duty cycle:	3,000 sheets per month	
MPBF (Mean Prints Between Failures):	30,000 sheets	
MTBF (Mean Time Between Failures):	3,000 hours	
Durability:	5 years or 300,000 sheets (whichever comes first)	

Electrical

Voltage:	120VAC±10%,60Hz±3Hz
Power consumption:	720 VA

Controller hardware

RAM: Total Memory: 512K bytes

2MB Memory Board: The optional 2MB memory board provides **enough** memory for full-page, 300 dpi graphics plus additional memory for downloading and other purposes. This board **may** be upgraded to 4MB to give you an additional 2MB of memory. (Call 1-800-873-7766 for information.)

Environment

Operation: Temperature: 50 to 95°F (10 to 35°C)

Humidity: 20 to 80% RH without condensation

Storage: Temperature: 32 to 95°F (0 to 35°C)

Humidity: 20 to 80% RH without condensation

CAUTION: The life of consumables may be significantly reduced if they are stored at temperatures outside the range stated above.

Internal modes

HP LaserJet series II emulation
FX emulation

Interface Specifications

The laser printer has the following resident interfaces:

- Parallel
- RS-232C/RS-422A serial.

Parallel interface

Your printer is equipped with an 8-bit parallel interface.

Pin assignments for the parallel interface

The parallel interface connector pin assignments and a description of the interface signals are shown in the table below.

Signal Pin	Return Pin	Signal	Direction	Description
1	19	DATA STROBE	IN	Signal to read data in.
2	20	DATA 1	IN	These signals represent information of the 1st to 8th bits of parallel data respectively. Each signal is at HIGH level when data is logical 1 and LOW when it is logical 0.
3	21	DATA 2	IN	
4	22	DATA 3	IN	
5	23	DATA 4	IN	
6	24	DATA 5	IN	
7	25	DATA 6	IN	
8	26	DATA 7	IN	
9	27	DATA 8	IN	
10	28	$\overline{ACK}$	OUT	Acknowledge receiving data.
11	29	BUSY	OUT	A HIGH signal indicates that the printer cannot receive data.
12	-	PE	OUT	A HIGH signal indicates that the printer is out of paper.

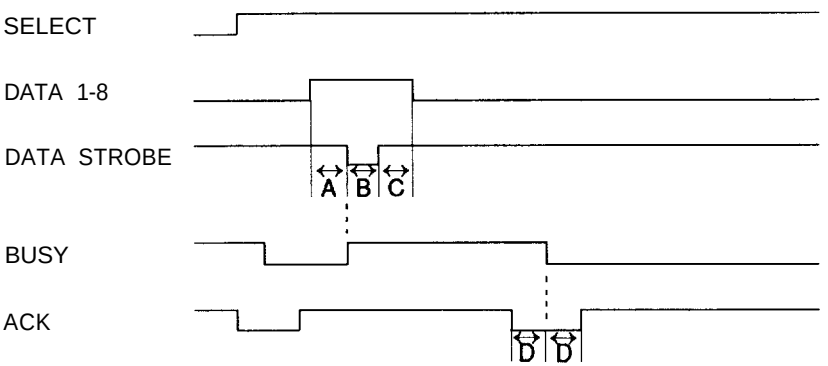
Signal Pin	Return Pin	Signal	Direction	Description
13	—	SELECT	OUT	When SELECT is HIGH, the printer is on line.
14	—	NC	—	Not defined.
15	—	NC	—	Not defined.
16	—	0V	—	Signal ground.
17	—	CHASSIS GND	—	Safety chassis ground.
18	—	+5V	—	5V power supply output. (300mA maximum.)
31	30	$\overline{\text{INIT}}$	IN	Initial stage after data inside buffer is printed.
32	—	$\overline{\text{FAULT}}$	OUT	This signal becomes LOW when the printer is: • off line • in error state • malfunctioning.
33	34	NC	—	Not defined.
35	36	NC	—	Not defined.

Notes

- All interface conditions are based on TTL level. Both the rise and fall of each signal must be less than 0.2 microseconds.
- The column heading "Direction" refers to the direction of signal flow as viewed from the printer.
- "Return" denotes the twisted-pair return, to be connected at signal ground level. For the interface wiring, be sure to use a twisted-pair cable for each signal and to complete the connection on the return side. These cables should be shielded and connected to the chassis of the host computer and the printer.

Interface timing

The figure below shows the timing for the parallel interface.



A: 1 µs (min.) B: 1 µs (min.) C: 1 µs (min.) D: approx. 6 µs

Signal levels

Output signals:	V_{OL} = 0 to 0.4 V
	V_{OH} = 2.4 to 5.0 V
Input signals:	V_{IL} = 0 to 0.8 V
	V_{IH} = 2.0 to 5.0 V

Serial interface

The laser printer's built-in serial interface can be set for either RS-232C or RS-422A operation. These interfaces have the following characteristics.

Data format

Word length:	7 or 8 bits
Parity:	0 or 1 bit (None, Odd, Even, Ignore)
Start bits:	1 bit
Stop bits:	1 or 2 bits

The data format can be set using functions and menu items in SelecType.

Baud rate

300, 600, 1200, 2400, 4800, 9600, 19200 bits per second.

Signal level

RS-232C:	V_H = 2.2 to 12V
	V_L **= -1.4 to -12V**
RS-422A:	V_H **= 2.5** to 5V
	V_L = 0 to 0.5V

Transmission procedures

Ready/Busy:

- The DTR signal level changes to HIGH when the printer is ready to receive data (or to LOW if set for inverted operation by SelecType).
- **The DTR** signal level changes to LOW when the printer is not ready to receive data **(or to HIGH** if set for inverted operation by SelecType).

XON/XOFF:

- When the printer is ready to receive data, it sends an XON (11 hex) to the host computer through the TD line for the RS-232C interface or SD+ and SD- lines for the RS-422A interface. When ROBUST-XON is set to ON (by SelecType), and data is not received within one second of the XON signal being sent, the printer sends an XON signal every second. If ROBUST-XON is set to OFF, the printer sends only one XON signal.
- When the printer is not ready to receive data, it sends an XOFF (13 hex) to the host computer through the TD line for the RS232C interface or SD+ and SD- lines for the RS-422A interface.
- The printer is ready to receive data when it is on line, no error conditions exist, and the buffer is not filled above the overload value set with SelecType.
- The printer is not ready to receive data when it is off line or when it is on line but the remaining capacity of the data buffer is less than the overload buffer value.

Serial interface pin assignments

The serial interface connector pin assignments and a description of the interface signals are shown in the table below. The direction of signals is given relative to the printer.

Signal Pin	Signal	RS-232C	RS-422A	Direction	Description
1	FG	*	*	—	Frame ground. Safety ground line.
2	TD	•		OUT	Transmit data. This pin transmits serial data from the printer to the computer.
3	RD	*	(RD-) invert	IN	Receive data. This pin transmits serial data from the computer to the printer.
4	RTS	*		OUT	Request to send. This pin is HIGH when power is on.
5	CTS	*		IN	Clear to send. This pin indicates that the computer is ready to receive data from the printer.
6	DSR	*		IN	Data set ready. This pin indicates that the computer is ready to communicate.
7	SG	*	*	—	Signal ground. This pin provides a ground for all the signal lines.
9	SD		(SD-) invert	OUT	Send data. This pin sends serial data from the printer to the computer. Signal level is RS-422A.

Signal Pin	Signal	RS-232C	RS-422A	Direction	Description
10	SD		(SD+) non-invert	OUT	Send data. This pin sends serial data from the printer to the computer. Signal level is RS-422A.
11	REV	*		OUT	Same as DTR.
18	RD		(RD+)	IN	Receive data. This pin transmits serial data from the computer to the printer. Signal level is RS-422A.
20	DTR	*		OUT	Data terminal ready. This pin indicates whether or not the printer is ready to receive data. If the printer ready protocol is not selected, this pin is always HIGH (i.e. the printer is ready to receive data). If printer ready protocol is selected, the printer can accept data when the pin level is HIGH, and cannot accept data when the pin level is LOW, when busy.
25	+5V DC	*		—	Not a signal, but a +5V power supply output. Maximum of 300mA.

* Signal is operational for the interface.

DIP switches

Select the required serial interface by setting the DIP switches on the back of the printer as follows:

	1	2	3	4	5	6	7	8
RS-232C	OFF	OFF	OFF	OFF	*	OFF	OFF	ON
RS-422A	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF

* If DIP switch 5 is turned ON when the RS-232C serial interface is in use, pin 25 on the connector is set to +5V; if the DIP switch is turned OFF, the pin on the connector is not used.

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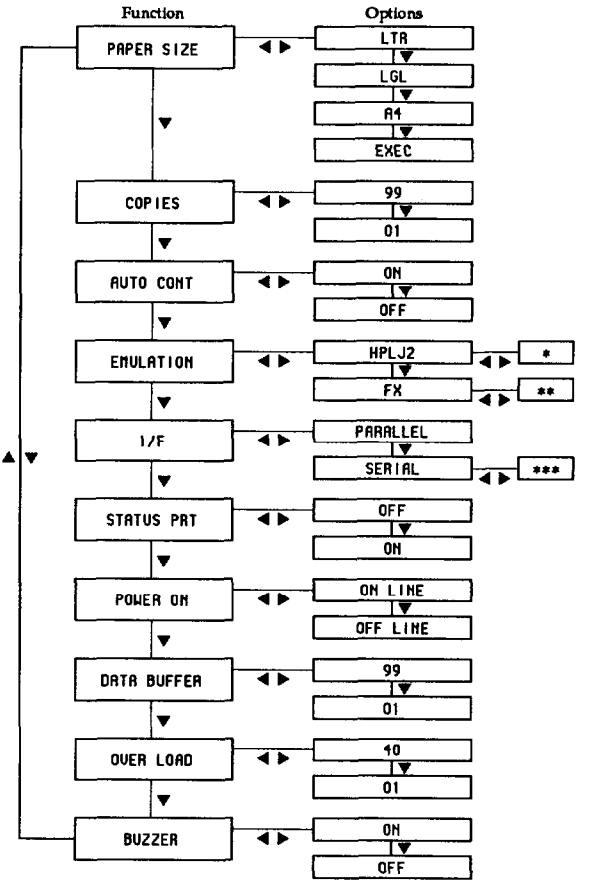
EPSON® *Action* Laser PLUS™

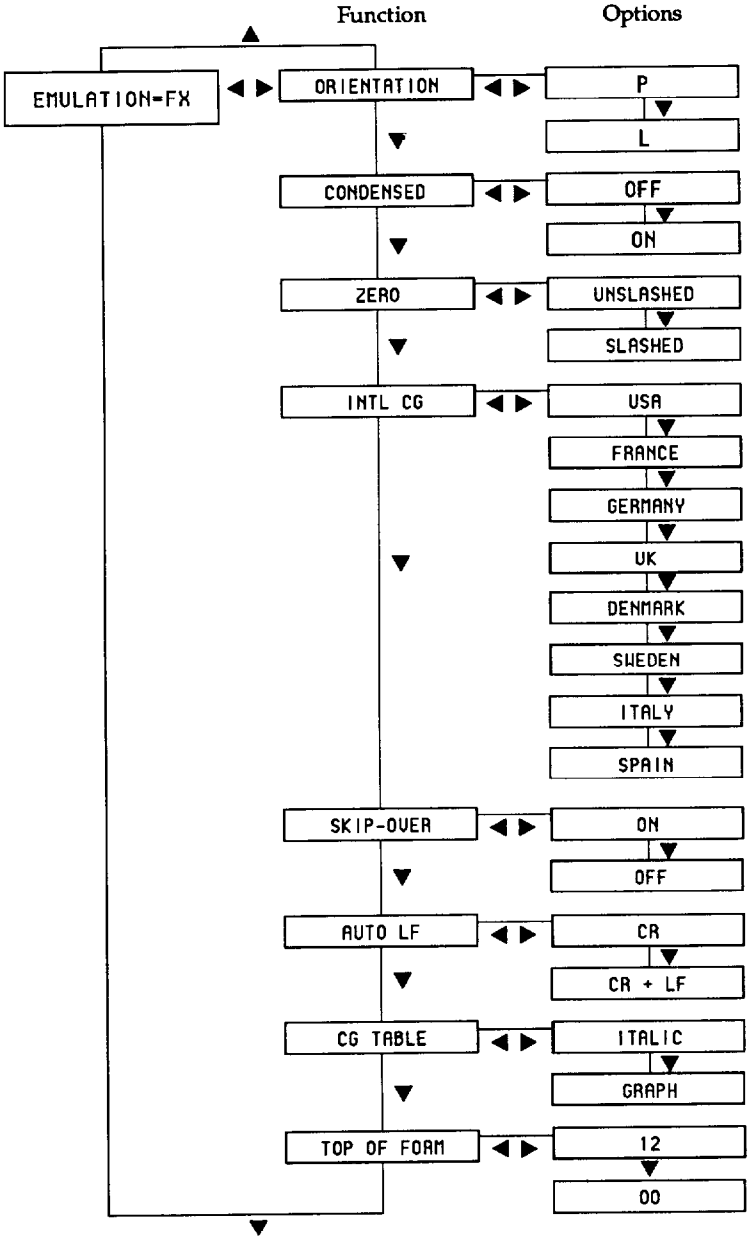
Quick Reference

SelecType Main Menu

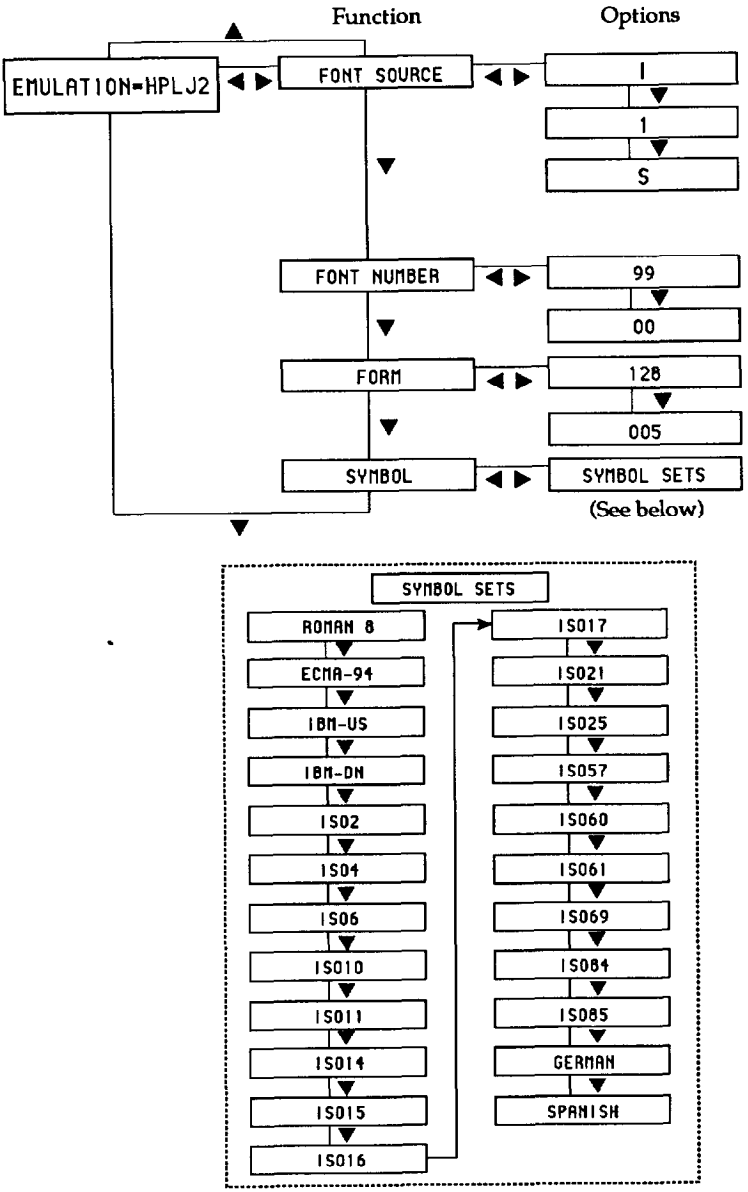


* See the HP Emulation submenu
** See the FX Emulation submenu
*** See the Interface submenu

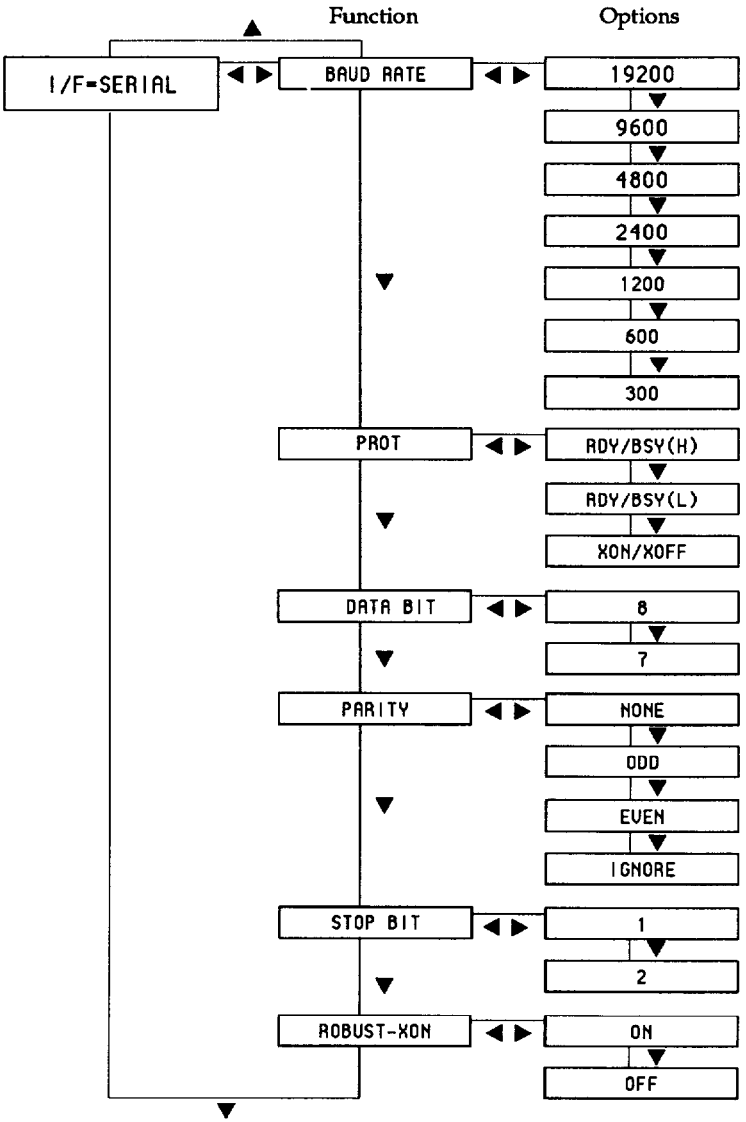
FX Emulation Submenu

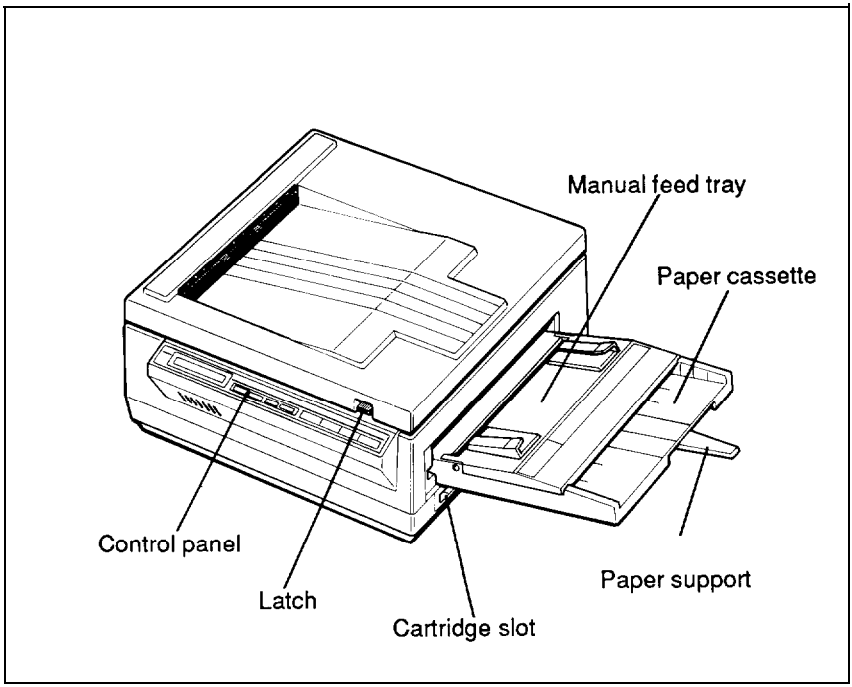


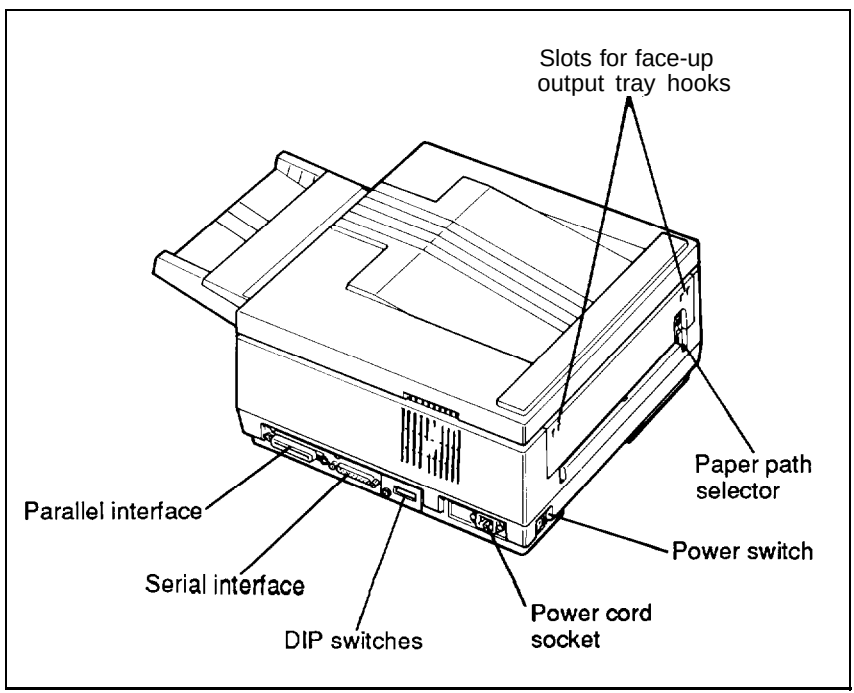
HP Emulation Submenu

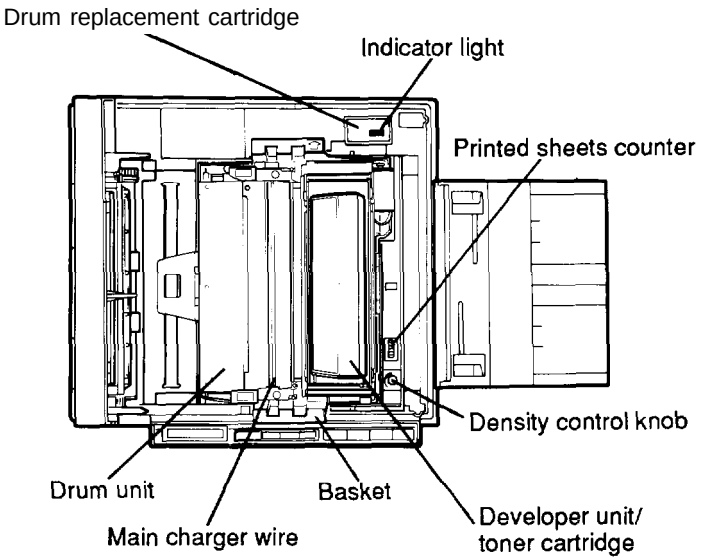


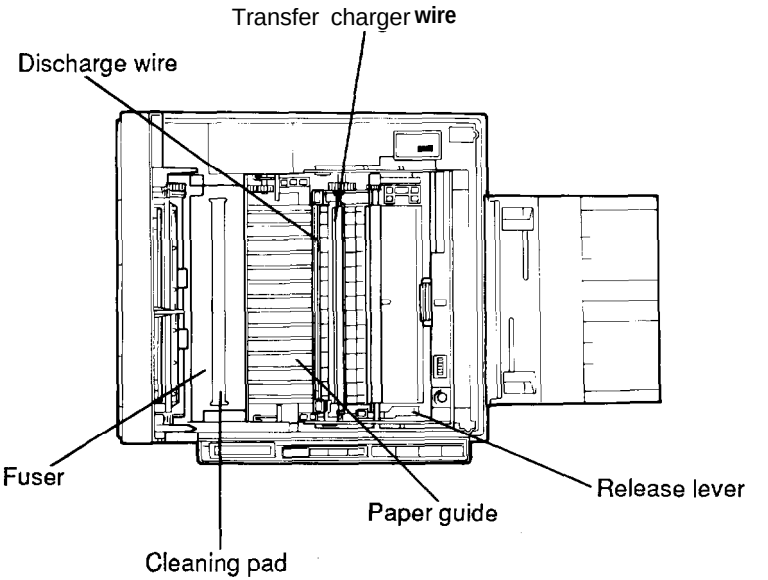
Interface Submenu




Manual feed tray
Paper cassette
Control panel
Latch
Cartridge slot
Paper support


Slots for face-up
output tray hooks
Paper path
selector
Parallel interface
Power switch
Serial interface
Power cord
socket
DIP switches


Drum replacement cartridge
Indicator light
Printed sheets counter
Density control knob
Drum unit
Basket
Main charger wire
Developer unit/
toner cartridge


Transfer charger wire
Discharge wire
Fuser
Release lever
Paper guide
Cleaning pad

EPSON AMERICA, INC.
2780 Lomita Boulevard
Torrance, California 90505

Actionlaser Key Features:

- High Quality, 6 PPM Laser Printing
- Six Built-in Fonts
- Graphics Capability
- Popular Font Cartridges Supported
- HP PCL® Compatibility
- Flexible Memory Upgrade
- Front Panel Control Operation
- Multi-Purpose Paper Tray
- One Year Limited Warranty With (Service For The First Six Months